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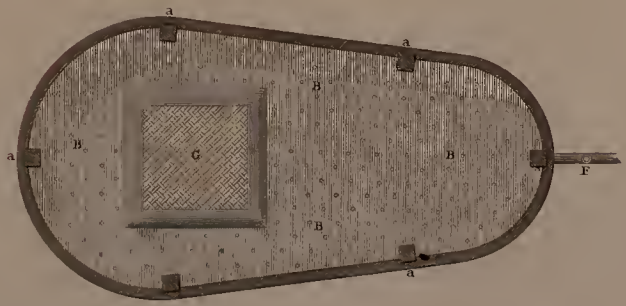
SECTION OF THE FRAME OF A VAPOUR BATH

Fig. 1

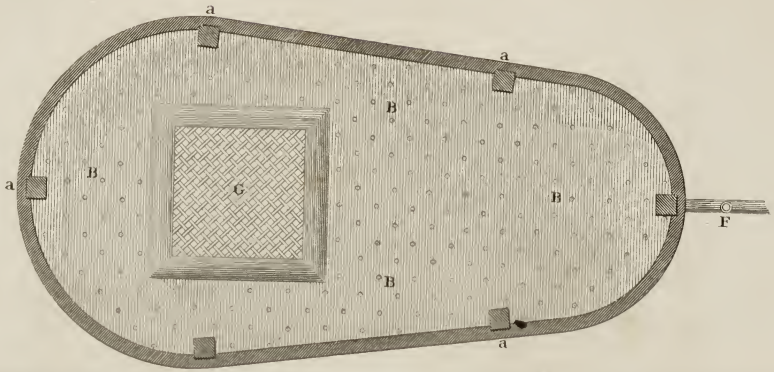
Fig. 2



Scale of one Inch to a Foot

Published by Knight & Lacey, Paternoster Row 1825

Fig. 2



Scale of one Inch to a Foot

A

TREATISE

ON THE

PROPERTIES AND MEDICAL APPLICATION

OF THE

VAPOUR BATH,

IN

ITS DIFFERENT VARIETIES, AND THEIR EFFECTS,

IN VARIOUS SPECIES OF DISEASED ACTION.

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TO

THE RIGHT HONOURABLE

MARQUIS CONYNGHAM,

&c. &c.

My Lord,

Presuming upon the distinguished kindness I have experienced from your Lordship, the following Treatise is submitted to your notice, under impressions and sentiments of deep-felt gratitude, as a small but sincere tribute of esteem and respect, from

Your Lordship's

Most obedient humble servant,

J. GIBNEY.

Brighton, No. 26, *Steyne,*
July 1825.

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PREFACE.

An enquiry respecting the use and influence of different baths, in disease, having occupied my attention for some years past, I am induced to publish the result of my experience upon the nature and effects of the Vapour-Bath, as a continuation of my Observations upon Baths in general, which have been for some considerable time before the Public.

At the period of their publication, want of experience prevented me from entering upon the present part of the

subject, with so much satisfactory information as has been since afforded me by a residence at Brighton, during many years, and at a time when the use of the Vapour-bath has considerably increased in general estimation.

A daily inspection of its powers and its influence upon the variety of diseases that present themselves in so populous a sea-bathing place, has confirmed me in the conviction of the advantages arising from it; and, in most instances, of its superiority over the usual mode of bathing. From this experience, I am of opinion, it should be considered, in most circumstances, as a much more *powerful* agent than the common fluid-bath, under any degree of heat; and hence, (to obviate

the abuses which but too commonly arise from temerity or inexperience,) more prudence and circumspection will be required in its administration; and, like all other means of an active character, used for the removal of disease, respecting which there may be doubt or a difficulty, whatever facts we possess should be made as generally known as possible.

With this design principally in view, the following compilation of facts and observations has been selected and arranged, with some degree of reflection upon the subject, and with solicitude to render it better understood than it has yet been by practitioners in this country. Many of these particular observations

and circumstances, valuable in themselves, have been made public, in works of a more enlarged character; but so partially interspersed with other matter, and so little in detail, as to afford a very imperfect and inadequate view of a practice which should be looked upon as of very general consideration and utility, requiring a certain degree of systematic arrangement, with reference to its physical and chemical properties.

In order that these particular properties and the nature of vapour may be more clear and distinctly understood, the practical result of whatever information I could derive from others, as well as from my own personal experience, has been brought to bear upon the subject,

with as little obscurity as was within my power.

In this, at first view, I conceived there would have been less difficulty than what I subsequently found to be the case; partly arising from causes just mentioned, and in a greater measure from the number of essays written specifically upon the subject under consideration, being very few.

However, it may be justly observed, that the nature and qualities of vapour are more deserving of explanation than, as far as I am instructed, has hitherto been bestowed upon it, as a curative means in disease, and requiring more circumspection than any other form of bath; for, with every possible advantage

which practical information affords, arising from the most attentive observation upon its general use and particular influence, yet such are the peculiarities of habit and constitution, from a great variety of causes, particularly those that present themselves as the consequences of the luxury and refinement of the age in which we live, independent of casualties from other sources, that difficulties frequently occur which render its application often perplexing and dangerous.

Abuses of the most pernicious kind arose from the too frequent and constant use of heated air amongst the Romans, either to diminish the inconvenience or distress of an over-loaded stomach, or to promote an appetite for food in an unne-

cessary degree: — Pliny inveighed with earnestness against the medical practitioners of the day, who could suffer so unjustifiable a practice for the selfish and despicable gratification of the appetite, so often exercised by those whose moments were devoted to gross sensuality and the luxuries of the table; and Seneca, beholding this luxurious practice increase considerably during his time, is still more indignant against the abuses arising from too frequent an exposure to heated air, which enervates and exhausts the strength of the body; — but the importance of baths was of such moment amongst these people, and wherever their conquests extended, that for many centuries they were an object of the constant care and

attention of the government; yet, from their general and extensive use, abuses were inevitable, so as to injure the character of a practice at once salubrious and grateful, and often productive of health and vigour.

It may be truly remarked, that where any remedy of such import is administered indiscriminately and incautiously, it becomes more than difficult to bring it under any degree of regularity; but when this is in part effected, a promise of further progress soon follows, and we become more and more satisfied at each step that leads us to steady principles and just conclusions.

JOHN GIBNEY.

Brighton, *No.* 26, *Steyne*,
July, 1825.

ON

VAPOUR BATH,

FRICTION, SHAMPOOING,

&c. &c.

CHAPTER I.

Introduction—Vapour Bath less used formerly—Not chemically or scientifically understood—Its Use in Russia, Sweden, and Egypt—Practice in Cold Climates—Use amongst uncultivated Nations—Coxe's Description of Russian Baths——Savary's Account of Egyptian Baths.

To trace the causes that have hitherto operated against the practice of bathing in general, under its different forms and modifications, and to ascertain why the use of the Vapour Bath has not been more known

among us, would be an enquiry attended with less utility than difficulty.

The prevailing use of baths, as a means of relief in disease, or as a salutary or luxurious custom, existed in former times much less among us as a people than it does at present; and this more particularly as to the knowledge and application of the steam or Vapour-bath, which, until of late years, was more known as a remedy than scientifically or chemically understood; but, as the proofs of its efficacy, both here and upon the Continent, are becoming more numerous, the natural result must be, that the practice will extend in a ratio equal to its utility.

Among different nations, the medical application of Vapour varies according to habit and casual circumstances;—in many places, the steam or Vapour being naturally produced, while in others, to fulfil every salutary purpose, this of necessity must be effected by artificial means.

The administration of Vapour, in disease,

may be traced to the days of Hippocrates; and was efficaciously used by Celsus, Galen, and many of the Arabian Physicians; but, to the inhabitants of the East, to the Egyptians, the Greeks, and to the Romans, its active application, both topically and generally, has been extensively known, but more known than understood, from the most early records up to the present day.

In the burning regions of the East, and in the frozen and extended countries of Russia, Finland, Sweden, &c. the practice has become as general as is the estimation in which it is universally held; probably arising from the existence of sensations and disease peculiar to regions remarkable for the extremes of heat and cold; added to this, the constant habit of a people occupying those districts is such, that existence becomes painful without the comfort of the bath under one form or another; indeed, to such a degree, that a strict preclusion from its use is exercised and considered as a

punishment of considerable severity. Should any instance of this nature occur among the Egyptian women, from an interdiction by the husband or otherwise, it would be considered of so cruel a nature, as to cause general disapprobation; for they not only enjoy the greatest delight from the salutary luxury of the bath, but when they assemble at the adjoining apartments, converse with the greatest animation upon subjects of every agreeable description.

In the colder districts, apartments, heated to a very high temperature, are used as baths, and after the necessary time of exposure, the bathers are habituated to rush into cold and frosty air; nay, numbers, from a high degree of heated medium, plunge into cold water contained in a pond convenient to the bath, or in winter roll themselves in snow, which, from force of habit, is found productive of no bad consequence, even though the change from heat to cold, and from cold to heat, is often reiterated; on

the contrary, the removal of disease is frequently known to succeed; and, it is worthy of remark, that this custom is found among most uncultivated nations, from the experience of its utility.

In these countries, and in Lapland, the same mode of bathing, as well as in producing Vapour, maintains, as in Japan;—from heated flints the apartment is raised to a high temperature, and by this means, in Iceland, their dry and sweating rooms are raised as high as 115° of Fahrenheit. Boys and girls, with their parents, indiscriminately enter, and to open the pores, and promote a more free perspiration, the surface of the body is gently struck with twigs, formed sometimes from one shrub, sometimes from another; this produces both a pleasing and useful effect, and is succeeded by feelings of grateful relaxation and refreshment.

In his travels in Russia, Cox describes the Russian bath as "containing one room

provided with ranges of broad benches, placed like steps one above the other, almost to the height of the ceiling. — Within were about twenty persons undressed; some were lying upon benches, some were sitting, others standing; some were washing their bodies with soap, others rubbing themselves with small branches of oak-leaves tied together like a rod; some were pouring hot water upon their heads, others cold water; a few, almost exhausted by the heat, were standing in the open air, or repeatedly plunging into the Volkof."

In another account, he says, "Having taken off my clothes, I laid myself down upon the highest bench, while the bathing-woman was preparing tubs of hot and cold water, and continued to increase the vapour by pouring water upon heated stones. Having dipped a bunch of twigs into the hot water, she repeatedly sprinkled and then rubbed with it my whole body. In about half-an-hour I removed to the lower bench,

which I found much cooler; when the bathing-woman lathered me from head to foot with soap, scrubbed me with flannel for the space of ten minutes, and throwing several buckets of warm water over me, till the soap was entirely washed off, she finally dried me with napkins.

"As I put on my cloaths in a room without a fire, I had an opportunity of remarking that the cold air had little effect on my body, though in so heated a state; for, while I was dressing, I felt a glow of warmth, which continued during the whole night. This circumstance convinced me, that when the natives rush from the Vapour-baths into the river, or even roll in the snow, their sensations are in no respect disagreeable, nor the effect in any degree unwholesome."

To this account may be added that given by Savary, in his letters respecting Egypt, where, as beautifully described by him, the manner of using the Vapour-bath

is much more elegant and convenient, and found to be in very constant and general use.

"The first apartment in going to the bath is a large hall, which rises in the form of a rotunda, and is open at the top, to give a free circulation to the air. A spacious estrade, or raised floor, covered with a carpet, and divided into compartments, goes round it, on which the bather leaves his clothes.

"In the middle of the building is a *jet d'eau*, which spouts from a bason, and agreeably entertains the eye. When you are undressed, you tie a napkin round your loins, take a pair of sandals, and enter into a narrow passage, where you begin to be sensible of the heat. The door shuts to, and at twenty paces you open another, and go along a passage at right angles with the first; here the heat increases: they who are afraid of exposing themselves suddenly to a strong degree of it, stop in a marble

hall in the way to the bath, properly so called.

"The bath is a spacious and vaulted apartment, paved and lined with marble, around which are four closets. The Vapour, incessantly arising from a fountain, and cistern of hot water, mixes itself with the burning perfumes, and produces the most agreeable effects. Extended on a cloth spread out, the head supported by a small cushion, they stretch themselves freely in every posture, whilst they are enveloped in a cloud of odoriferous vapours, which penetrate into every pore.

"After reposing there for some time, until there is a gentle moisture over the whole body, a servant comes, presses you gently, turns you over, and when the limbs are become supple and flexible, he makes all the joints crack without any difficulty; he masses and seems to knead the flesh without making you feel the least pain. This operation finished, he

puts on a stuff glove, and rubs you a long time.

"During the operation, he detaches from the body of the patient, which is running with perspiration, a sort of small scales, and removes the imperceptible impurities that stop the pores; the skin becomes soft and smooth like satin. He then conducts you into a closet, pours the lather of perfumed soap upon your head, and retires. This closet is provided with a cistern, and two cocks, which supply hot and cold water —here the bather washes himself. Soon after, the servant returns with a depilatory pomatum, which, in an instant, makes the hair fall off the places to which it is applied: both men and women make general use of it in Egypt—it is composed of a mineral called *rusma*, (supposed to be an *oxyd* of *arsenic*,) which is of a dark brown colour: the Egyptians burn it lightly, knead it with water, mixing it with half its quantity of slacked lime; this greyish paste,

applied to the hair, makes it fall off in two or three minutes, without giving the slightest pain.

"After being well washed and purified, you are wrapped up in hot linen, and follow the guide through the windings that lead to the outer apartment; this insensible transition from heat to cold, prevents our suffering any inconvenience from it. On arriving at the estrade, you find a bed prepared, and when laid down, a child comes to press every part of your body with his delicate fingers, in order to dry you thoroughly. The linen is changed a second time, and the child gently grates the callosity of the feet with pumice-stone; he brings a pipe and mocha coffee.

"Coming out of the stove, surrounded by a hot and moist Vapour, where the perspiration gushes from every limb, and transported into a spacious apartment open to the external air, the breast dilates, and you breathe with voluptuousness—perfectly massed, and

as it were regenerated, you experience an universal comfort, the blood circulates with freedom, and you feel as if disengaged from an enormous weight, together with a suppleness and lightness to which you have hitherto been a stranger; a lively sentiment of existence diffuses itself to the very extremities of the body, while it is lost in delicate sensations, the soul sympathizing with the delight, enjoys the most agreeable ideas—the imagination, wandering over the universe which it embellishes, sees on every side the most enchanting picture, and every where the image of happiness. If life be nothing but the succession of our ideas, the rapidity with which they then recur to the memory, the vigor with which the mind runs over the extended chain of them, would induce a belief, that in the two hours of that delicious calm that succeeds the bath, one has lived a number of years."

This account is obviously intended to shew the luxurious results of the practice,

more than its medical influence; but, at the same time, it gives us to understand how very salutary its effects must prove, when modified and appropriated to the condition of disease.

CHAPTER II.

Process of Massing — Observations on Friction — Friction and Percussion—Mexican Bath—Temazcalli—Dr. Pocock on Turkish Baths—Franklin on Baths of Persia—Persian Baths—Baths among the Moors and Spaniards—Dry Heat preceding Vapour — Baths of Abano — Commentary on Abano—Appearance in Disease—Practice similar to Cataplasms — Sudatorium — Great Repute — Carlsbad — Heat excessive—Bathe as well as drink—Perspiration follows—Reiteration also necessary at Abano—Sudatories in St. Germano—those of Baia intensely hot—their good Effects by Test of Time—Nero's Palace—Baths of Nero.

The process of *massing*, as mentioned above, and so called by the Egyptians, is in most respects the same as shampooing, as used throughout India, and in the Levant; which immediately succeeding to the baths, causes a unison of action between the muscular fibre and the surface, that occasions both a salutary and refreshing sensation; in a subsequent part of this Treatise, a more general and particular account of this mechanical action over the surface, will

be attended to — from which, with proper application, and the necessary perseverance, considerable advantage has arisen in a variety of instances, but its efficacy and advantage depends greatly upon the dexterity and manner in which the operation is performed, which, although merely consisting of a particular mode of friction and pressure, or gentle percussion, is to be attained but by practice and long habit.

Those whose hands are soft and smooth are best suited to this occupation, and, from practice, they become so habituated to the process, as to be enabled to continue it for a long time, and in a manner both agreeable and efficacious, producing sensations that by sympathy influence diseased action, in distant and interior parts, and assisting nature in the salutary functions of absorption and secretion, by slow but by certain and imperceptible gradations.

Judicious percussion and pressure along the course of the muscles, from their inser-

tion to their origin, and from their origin to their insertion, also materially assist towards the above desired purpose.

The ancient Mexicans used a Vapour-bath which, in a degree, was peculiar to themselves, and which to this day is practised by their descendants.

Its form is that of "an oven, with an opening at top, and it is constructed of raw bricks, the floor of the bath being somewhat convex, and lower than the surface of the earth, and, according to the Abbé Cavigero, the greatest diameter is eight feet, and the height six feet, the entrance being sufficient to allow a man to creep into it; this, with its furnace heated from without, is the common structure of the TEMAZCALLI.

"The bather, with his attendant, enter, close the door, and while he reclines upon a mat, the attendant throws water upon a hot porous stone, placed on the stove, from which a dense vapour arises, which he directs or drives downwards, and, with a bunch of

maize, or herbs made moist, gently beats the invalid, particularly on the diseased part; a copious soft sweat follows, which is continued for a longer or a shorter time according to circumstances."

Doctor Pocock, in speaking of the Turkish baths, says, "one of the greatest refreshments among the Turks is in going to their bagnios; in the first large room, generally covered with a cupola, they undress, and putting on their wooden pattens, which they use also in their houses, they go into the hot room, where they are washed and rubbed with brushes and hair-cloths; they rub the feet with a sort of grater made of earthenware, something resembling the body of a bird; they make all the joints snap, even the very neck and all down the back, which they think makes the joints supple, after this they are shaved, and go into the bath; from this place they return by a room not so hot, where they stay awhile, and from thence go into the great room, repose

in a bed, smoke their pipe, take their coffee, and dress."

With some variation the practice among the Persians is pretty much the same; Franklin describes the baths of Persia as large and commodious — "the bath is a large room, of an octagon form, with a cupola at top, through which the light and air are admitted; on the sides of this room are small platforms of wood, raised about a foot from the ground, on which the people who enter to bathe perform their devotions, a ceremony the Persians always previously observe. At the upper end of the room is a large bason or reservoir of water, built of stone, well heated by means of stoves made at the bottom, with iron gratings over them, and adjoining is another reservoir of cold water, of either of which the bather has his choice.

"When he comes out of the hot bath, which is generally in the space of ten or twelve minutes, the people in the house

stand ready to perform the operation of rubbing; and to effect this, he is laid at full length on his back, with a pillow to support his head; a brush, made of camels' hair, is then used, which completely rubs off all the dirt the body has contracted.

"After rubbing some time, they rinse the whole body several times, with several basons of warm water, and the person is reconducted to the dressing apartment, where he shifts and dresses at leisure, receiving a *calian* to smoke.

"The Persians are much more scrupulous than any other eastern nation in permitting foreigners to go into their baths, which, if attempted with their knowledge they prevent, as the bath, by the admission of a *ferengy*, or foreigner, would be deemed polluted."

The Moors and ancient Spaniards used rooms and sweating-chambers, formed after the manner at present practised by the American Indians, and which were filled with

vapour of a very high degree of temperature, by dashing water on heated stones.

In times far remote, the Spaniards introduced this practice among the Irish, and, by means of small conical buildings, rudely constructed, its use, under one form or another, has been pretty general amongst the working class of that people, up to the present time.

The patient sat or stood within a small conical building, which had been previously heated, and soon after followed a general flow of perspiration. The topical application of vapour, in cases of slow parturition, still prevails, and is advantageously practised upon an improved plan at present in Paris.

Among some of the northern nations, it is in use to expose the body for some time to a *dry heat*, previous to the admission of vapour, and then the latter is believed to have a more direct influence; this practical fact, derived from a source where science

has no place, is deserving of attention, and will receive illustration as we proceed in the consideration of vapour.

The hot springs of Italy and of Germany are found by long experience to be of signal efficacy when used in their fluid or vaporific state. The reputation of the baths of the village of Abano, a few miles from Padua, and in the vicinity of the Euganean hills, has been long since established.

They arise from a tumulus in a plain, and "burst forth in two or three copious streams of hot water, which are capable of boiling an egg hard at their source." A modern traveller expresses himself thus: "It is not, however, upon its geological wonders that the modern notoriety of Abano principally rests. It is celebrated for its muds, which are taken out of its hot basins, and applied either generally or partially, as the case of the patient may demand.

"These are thrown by after having been used, and at the conclusion of the season

returned to the hot fountains, where they are left till the ensuing spring, that they may impregnate themselves anew with the mineral virtues, which these are supposed to contain.

" The most obvious of those to an ignorant man, are salt and sulphur. The muds are, on being taken out, intensely hot, and must be kneaded and stirred some time, before they can be borne. When applied, an operation which very much resembles the taking a stucco cast, they retain their heat, without much sensible diminution for three-quarters of an hour, having the effect of a slight *rubefacient* on the affected part, and producing a profuse perspiration from the whole body."

Thus, by the agency of this mud, either generally or topically applied, a hot vapour is produced, causing an active circulation and efflorescence on the surface, so as to produce considerable advantage in gouty, rheumatic, and paralytic affections; for, by

confining the heated vapour, and retaining it immediately over the affected part, its efficacious consequences are often considerable; this, in a less degree, is the common result of our practice in the use of fomentations and cataplasms under certain circumstances, which prove useful in proportion to the heat, reducing the contained moisture into vapour on the affected part.

The vapour arising from these waters being conveyed into a sudatoreum, is applicable to the removal of a variety of diseases, which have been found to resist the waters as a bath, in the usual manner; and this effect, as well as that arising from the application of the mineralized muddy sediment, has raised the reputation of the baths of Abano so highly in arthritic, paralytic, and every species of muscular debility, that many of the accounts would seem incredible were they not well authenticated, which, however, must be considered as strong and convincing proofs of the superior effi-

cacy of steam in most diseases of this character.

At Carlsbad, in Bohemia, are the celebrated hot baths, first extolled into notice by Charles IV.; their degree of heat is excessive, and their efficacy is principally produced in conjunction with the use of heated rooms, while the patients drink these waters of as high a temperature, and in as large quantities as they are capable; a profuse exudation from the skin ensues, and the relief from diseased feeling is so considerable as to promise an immediate cure, did not experience teach that the reiteration of their use, often to a protracted period, is generally required towards its completion.

This latter observation is applicable to the vapour, mud, and mineral waters of Abano, which, after long and patient trials, have proved most successful, where, from a few applications at the commencement, the expected relief was by no means probable.

The natural warm baths of Italy, particularly those of ancient Baia, Tritoli, and St. Germano, are of so high a temperature as to produce vapour in considerable abundance.

In the sudatories of the latter place, where there are several apartments, an exposure to the heated steam issuing from the earth produces a copious flow of perspiration, its heat being modified and moderated according to circumstances.

In those of Baia, situated not far from the ancient ruins of the Emperor Nero's palace, the vapour near its source is so intensely hot, that it is not to be borne without very great inconvenience, but, under proper rule and regulation, the application of this steam to the removal of many chronic diseases, is of most signal service, and from a modern account it is manifest that the test of time has confirmed the character those sudatories have obtained.

From a small work, published by M.

Marien Vasi, it may not be irrelevant to quote the following description of the Vapour Baths at Tritoli, or, as they are called, Nero's Baths, situated near to the lake Avernus.

BAINS DE NERON.

" Les habitans de Baies montrent aux voyageurs les etuves de Tritoli, sous le nom des Bains de Neron, parceque l'on dit que cet Empereur les avait faits construire pour son usage ; les paysans vont, avec la plus grand facilité, jusqu'au fond d'un grotte longue et étroite, chercher dans la source l'eau qui est presque bouillante. La chaleur de cette grotte est si grand qu'au bout de dix pas, on est, pour ainsi dire, suffoqué, et il faut de l'habitude et de la force pour aller plus loin ; ceux qui y entrent sont presque nus, et ils en reviennent au bout de deux minutes tous converts de sueur, le visage aussi enflammé que s'ils avaient été dans un four. Lorsque on

baisse la tête fort prés de terre, on a beaucoup moins de peine à respirer parceque la vapeur chaude occupe toujours la plus haut de l'étuve, et que l'air froid arrive par la partie inferieur.

" Il y a dans ces étuves six espèces d'allées, qui ont six pieds de haut, et trois pieds et demi de largeur. L'hopital de l'Annonciation de Naples tient une maison a Pouzol au commencement de l'été, d'ou l'on envoie a ces etuves les malades qui ont besoin de suer; on y passe un demi heure, plus ou moins, après quoi l'on se met au lit dans un endroit moins chaud.

" Le nom de Tritoli que portent ces etuves, peutetre leur été donné, parcequ'on y frotte les malades pour exciter encore mieux la sueur."

BATHS OF NERO.

" The inhabitants of Baia shew the stoves of Tritoli to strangers, under the name of the Baths of Nero; as it is asserted that

emperor caused them to be constructed for his use.

" The peasants proceed to the bottom of a long and narrow grotto, with the greatest facility, to fetch from its source the water, which is nearly boiling. The heat of this grotto is so considerable, that, at the distance of ten paces, one may be said to be nearly suffocated, and it requires both strength and habit to be enabled to proceed farther.

" Those who enter are nearly naked, and, in the space of two minutes, they return covered with perspiration, and their countenance flushed, as if they had been in an oven.

" When the head is bent very near the earth, respiration is much less difficult, as the heated vapour always occupies the highest part of the stove, and the cool air enters through the inferior part.

" There are in these stoves six different passages, which are six feet in

height, and three feet and a half in breadth.

" The hospital of the Annonciation at Naples, occupy a house at Pouzolli, at the commencement of the summer, from whence they send invalids, who require to be sweated, to these stoves; they remain therein about half an hour, and then retire to bed in a cooler place.

" The name of Tritoli, which these bàths bear, has probably been given to them, as friction is there used, the better to excite perspiration."

CHAPTER III.

Metaline Baths—Heated Air — Steam—Steam, comparative Weight of—Latent and Sensible Heat—Elasticity of Vapour —Air-Pump Vapour Bath—Atmospherical Pressure—Density and Elasticity — Air's Pressure, relative to Disease—Density of Atmosphere.

The Metaline Bath has been considered by some as of great utility in bracing the muscular fibre, and in recovering weak and decayed limbs, stopping hemorrage, and in female debility. This bath is prepared by throwing the scoriæ of metals as they come hot from the furnace into water, or heating them afresh, and using them in like manner.

From this, either a fluid or Vapour-bath is produced, and is said to be powerful in paralytic affections, debility of the articulations and muscles, or as a detergent in cutaneous foulness; but its indiscriminate use, from the unchemical manner of its

preparation, must render expectation from it very problematical, and its application difficult and uncertain.

To this general enumeration of the production and application of vapour from natural hot springs, might be added many other instances and circumstances corroborative of the beneficial effects which have followed from its medical use, under various conditions of disease, at periods far distant as well as at the present moment; but those already stated, are sufficient to indicate how useful every effort may hereafter prove in the general promotion of artificial means, by which all the efficiency of natural steam may be obtained and used with general advantage.

The powerful agency of air combined with water, and by heat converted into steam, is so generally understood, as applicable to a variety of mechanical purposes, where great power is required, and where, by late improvements, that power is found

to be so great, that a more striking or familiar proof of its elasticity should not be sought for:—this fact has a suitable, but rather indirect reference to the subject under consideration.

Water, when reduced to vapour, or when in an aërial elastic state, occupies about 1800 times the space it does when in its usual fluid condition, being lighter than atmospheric air, according to Kerwan, as 10 is to 12, or as 10 to 14, according to Saussure.

In this process of reducing water into vapour, a vast quantity of caloric, or the matter of heat, is absorbed, *without any manifest increase of temperature, beyond the boiling point.*

This great influx of heat becomes what the late Professor Black called LATENT HEAT, or heat combined with the elastic fluid, in a degree far more considerable than it manifests itself, except when it emits it on being condensed, when in contact with a cooler body.

It then, from latent, becomes evolved or SENSIBLE heat, and from experiment, were it accumulated, would amount to the sum of 900° of Fahrenheit's thermometer. "If we observe the heating of water, we shall find that the heat flows into it very fast, till it arrives at the boiling or vaporific point. Suppose that in the last five minutes its heat is increased 10°, in the next five we should expect that it would at least be six or seven more; but this is not in reality the case, for though very little of the water is evaporated, yet the remainder is not sensibly hotter.

"In order to prove the time necessary to convert a quantity of water into vapour, a number of flat-bottomed cylindrical vessels of iron were constructed, into which a quantity of water was put, at the temperature of 54°. The water was heated to the boiling point in four minutes, but it was not evaporated in less than twenty. Thus it is evident, that the water had acquired 158° of heat in

the space of four minutes, and consequently, as the heat of the fire continued the same, it required five times 158° of heat to convert it into vapour.

"This immense accession of caloric is, however, neither sensible in the water nor in the vapour, for if a thermometer is applied to the steam, it will not be found hotter than the boiling water; it is, therefore, really absorbed by the fluid, which is converted into vapour, and is retained in the latter in a combined state. When the vapour is condensed in the refrigeratory of a still, the latent or combined fire is once more rendered sensible, for the refrigeratory is heated much higher than the sensible heat of the vapour, as the heat, if accumulated, would raise the thermometer to more than 800°."—On this fact, its great power in the Vapour-bath may be considered to depend, and, in this particular relation, should be well understood.

Mr. Boyle caused air to fill a space

8000 times greater than that of its former volume; and, in another experiment, he occasioned it to expand 13680 times more than the space it formerly occupied; in a philosophical point of view, facts like these, respecting the qualities of air, are as useful and wonderful as many, with respect to the qualities of vapour.

"Vapour is an elastic fluid, that is, it admits of being compressed within a compass proportioned to the force which compresses it.

"Its force, in resisting compression when it is accumulated to a certain degree, is however greater than that of gunpowder, or of any power with which we are acquainted.

"Steam is, therefore, one of the most potent and one of the most dangerous agents in nature. A small quantity of water thrown upon boiling oil, or introduced among metals while in fusion, produces the most formidable effects. The water sinks towards

the bottom in the oil, where being converted into vapour, by the force of its expansion, it causes a most violent ebullition and explosion, and throws the heated fluid about with incredible velocity."

Thus far as regards its mechanical use; but, with respect to its medical application, its tenuity and elasticity are of very great consequence, it being so much less dense than atmospherical air; hence may be inferred the advantages from its powers and influence as a bath, more particularly as its rarified state may be progressively and considerably increased.

Some years since, an ingenious tract, entitled "Facts and Observations on the Use of the Air-Pump Vapour-bath," was published by Dr. Blegborough, in which he says, "the surface of an ordinary man's body may be estimated at about 2160 square inches, which, multiplied by fifteen, gives 32400lbs. or nearly $14\frac{1}{2}$ tons. This enormous pressure would crush us in an instant,

if it were not exactly counterbalanced by the spring of the air, or other elastic fluids diffused throughout every part of our bodies, just as the pressure on the outside of a full-blown bladder is sustained by the action of the air within; or, to give a still more apposite instance, as the pressure on the surface of a shrivelled apple is accurately counterpoised by the elasticity of the air contained in its pores.

"But now, if this full-blown bladder and shrivelled apple be placed under the receiver of an air-pump, we shall find, that as the air is exhausted, the bladder will be more and more expanded, till it burst, and that the wrinkles on the apple will gradually disappear, and its surface become plump and turgid.

"As an instance perhaps still more in point, we may mention a common experiment; if an egg, punctured in the small end, be placed in a wine-glass, with the pin-hole downwards, and subject to the action of an

air-pump, the elasticity of the air naturally enclosed in the egg will force its contents through the perforation; but, on re-admitting the air into the receiver, its pressure will drive the contents back again into the shell.

"Thus also it is with a small part of the human body, subjected to the operation of the syringe-cupping glass, which will illustrate our meaning better than the ordinary one.

"In proportion as the air is exhausted by the syringe, the fluids rush towards the small portion of surface, from whence the atmospheric pressure is removed with such force as to occasion a tumor, and thus the blood flows through the wounds previously made by the scarificator."

As immediately connected with this part of the subject, a retrospect should be had to the well-known influence of atmospherical pressure upon animal existence, and a very brief statement of facts, pretty gene-

rally known, may tend more fully to elucidate the object under consideration.

The weight of the atmosphere, by the use of the air-pump, is most satisfactorily proved to conviction, as it affords, when applied to philosophical purposes, a precise knowledge of the mechanical influence of air upon our bodies in general; and, from it has been deduced a theoretical series, equally clear and satisfactory.

Variations in the density and elasticity of the air that surrounds us, have considerable influence on animal life; "so great a pressure of air upon his body, may well surprise the ignorant man and shake his belief, but he must consider, that this weight of air he has carried from his earliest infancy.

"Sensations to which we have been always accustomed are scarce felt; we cannot perceive the difference of things when we have no standard by which to measure their variations; we cannot perceive the

weight of the air, because we have always felt its weight, and cannot remove from its pressure No one part of the body can be disturbed by its pressure, for it lays the load equally upon all; besides this, there is a resistance within the body, which serves to counterbalance that from without; and there is another consideration also, which naturalists have passed over unnoticed. The heat of our bodies rarifies the air on their surface, so that, in fact, an animal doth not sustain so great a pressure from the air, as cold inanimate substances are found to sustain. In short, to use the words of Borelli, 'since, by the air's pressure, none of the parts of our bodies can suffer separation, luxation, or contusion, nor any other change, it is impossible that this pressure can produce any pain.'

"This pressure can do no injury to the animal frame; we find it, by experience, of infinite utility.

"By it, the parts of our bodies are kept

compactly together; by it, the fluids in our vessels are prevented from bursting their canals.

"Travellers, in ascending high mountains, feel the want of this pressure, to which they are accustomed in the valley; as they ascend, they perceive a total lassitude from the dilation of their vessels, and, at last, the blood begins to burst through the fine coats of the lungs, and they spit blood. It is probable, that similar effects are not unfrequently produced by this variation in the weight of the atmosphere.

"Mead relates, that Dr. Pitcairn, in the year 1787, being at his country-seat near Edinburgh, in February, on a fairer day than usual at that season, was seized with a sudden bleeding, after an uncommon faintness; and, on the next day, on his return to town, he found the barometer was lower at that very hour than either he or his friend Dr. Gregory, who kept a journal of the weather, had ever observed it; and, that another friend of his, Mr. Cockburn, professor of philosophy, had died suddenly at

the same hour, by an irruption of blood from his lungs: and also five or six others of his patients were seized with different hemorrhages."*

In situations elevated far above the usual range of human existence, the atmospherical pressure becomes diminished in proportion, independent of external heat: — the consequences are very observable;—the air of Mont Blanc, which is about three miles above the level of the plains, is found to be little more than one half the density, causing laborious breathing, and even a flow of blood from the chest;—at this, we are not to wonder, when we consider that the fall of one-tenth of an inch of the mercurial column in the barometer, indicates a difference of pressure upon the surface of an ordinary-sized man's body, *equal to sixty-two pounds.*

Atmospheric pressure is clearly illustrated by its influence upon the barometer

* Philosophy of Medicine.

in common use; and, by accurate calculation, this pressure is equal to fifteen pounds weight on every square inch of surface; —a deduction from this fact may serve to explain the cause, in some degree, of the superior effects which heat, in the form of vapour, is found to have beyond that which it possesses in the form of a warm bath, having, at the same time, a superior electric influence. This superiority is still more obvious, when we consider, that the medium of the warm bath counteracts the expansion that heat produces upon our fluids; while, in the other, the rarified state of the heated vapour has an effect in proportion to the diminution of the external pressure it causes; the effects that consequently follow, are much greater upon the vital functions, and over diseased action, from the one than from the other; hence, we are enabled to form an estimate of the changes that may be induced by vapour of various degrees of temperature and tenuity.

CHAPTER IV.

Properties of Air and Steam—Mr. Leslie's Experiments—Air, its Condensation and Expansion—Application of Vapour—Sympathy of Exhaling Surfaces—Sudden Transition to High Temperature—Primary Effect of Vapour—Condensation of Vapour—Orifices of the Scarf Skin—Quantity of Perspirable Matter—Cuticular Absorption—Ingenhouz's and Cruikshank's Experiments—Secretion by Urine and Perspiration—Sequin and Lavoisier's Experiments—Organic Sympathy—Lord Bacon—Excessive Temperature—Experiments of Sir J. Banks, Sir C. Blagden, and Dr. Fordyce.

The applicability of the properties of air to those of steam, will be found correct, as to many particulars; at the boiling heat, steam is much less dense than atmospherical air, at the same time possessing equal elasticity; hence may be inferred the advantages as above, more particularly as its rarified state may be progressively and considerably increased.

To this may be added the result of Mr. Leslie's experimental enquiries on heat, who proves that "air is found to expand, in like

circumstances, five times more than alcohol, twenty times more than mercury, 160 more than platina, and 580 times more than glass."

He also proves "that heat is more copious in liquids than in solids, and in the airiform fluids than in liquids; that ice is more easily heated than water, *and water than steam.* The same addition of heat which would raise the temperature of ice ten degrees, would only raise that of water nine degrees, and that of steam six degrees.

"Application of warmth invigorates the dissolving power of the air, while, by distending the particles of the subjected water, it facilitates the passage into vapour, and the diminution or removal of the incumbent atmosphere produces a similar effect, by giving a freer or less restrained play to the repulsion of the liquid particles, and hence assisting indirectly the attraction of the solvent medium.

"On this principle depends the consump-

tion of heat, and the consequent reduction of temperature, occasioned by the evaporation of liquids, which are exposed to the access of dry air.

"The capacity of saline solutions for heat, is greater than the intermediate capacity of the water and the salt."

In general, our means of procuring the discharge of heat are greater than those which occasion its absorption. "Common air, on being condensed thirty times, has its capacity for heat reduced to one half; and, if suddenly compressed to twenty times its ordinary density, will disengage so much heat, as to shew an elevation of temperature equal to nine hundred degrees by Fahrenheit's scale, and sufficient for the inflammation of most bodies."

These facts are of considerable moment, as they clearly shew the wide distinction between vapour and heated water, in their separate application under the form of a bath; and as in the one, heat is conveyed

from a dense medium containing it in an under proportion, and from the other, a highly rarified medium, possessing it in a super-abundance, and imparting it with great facility, not only to the external surface of the body, but to the most minute air-cells of the lungs at the same instant, the effect should be considered very different indeed, and is consequently much greater upon the vital functions, and on diseased action, in the generality of cases; and further, this view of the subject may serve to illustrate the general effects of the medium in which we exist, and the changes that may be induced by the application of vapour of various degrees of temperature and tenuity; hence, when steam or vapour is diffused over the surface, and brought to exercise its full powers under proper regulation, the lungs expand with greater freedom, a succession of favourable changes often ensues, arising from their immediate connection, and dependant upon the invigo-

rated condition of the skin, and the rarified state of the medium then breathed.

The diminished pressure of the surrounding vapour, added to the active agency of heat, which is imparted under this form with great freedom, act like cordials to the stomach, imparting vigour and health; while the process of circulation and absorption proceed with energy and facility, the animal spirits become at the moment more exhilirated, and a pleasing and luxurious sensation pervades the whole system.

The unison and sympathetic consent between these two great exhaling surfaces is such, that a free and healthy expansion of the one is certain of producing a like and simultaneous condition of the other; and a regular exercise of their functions is so essential to a general salutary action, that, where they become irregular or deranged, a state of disease is inevitable; but, when performed agreeably to the ordination of animal life, those processes, on

which depend the varions secretions and other functional exercises of our wonderful existence, proceed with vigour.

This organic sympathy and the existing chain of connection is admirably and nicely balanced, so that, on the accession of disease in an internal organ of any importance, its presence is soon betrayed by a deranged action on the surface: on the contrary, where the vicissitudes of climate, or other causes, occasion an irregular action on the skin, the internal viscera, in one way or another, manifest disease in a greater or less degree.

In passing the equinoctial line, from the very sudden transition into an atmosphere of high temperature, the flow of perspiration being very profuse, the other secretions are consentaneously increased, and that of bile in a most considerable quantity. To this sympathetic action between the surface and the viscera in climates where the former is powerfully acted upon, may be imputed the morbid condition of these organs in

those who, from residence and exciting causes, have been for many years exposed to their baneful influence, sadly proving, by one of the laws of nature, that the more an organ is called into action, the more it is liable to disease.

With respect to the primary effect of vapour upon the human body, it may be here necessary to observe, that the temperature of the latter being some degrees lower than that of the former, causes a rapid and considerable deposition of watery fluid over the surface, which trickles down profusely. This, at first view, is often mistaken for perspiration, but is, for the most part, vapour deprived of a portion of its heat, by coming in contact with a body of lower temperature; and from it for some moments the sensation is rather unpleasant, until the pores are sufficiently open, and the perspiration flows with freedom, when the feelings become soothed, and the vital actions light and renovated.

The condensation of vapour upon the hair during this time, is very inconsiderable, indeed it is scarcely observable, as it appears comparatively dry; this, to many, seems a curious circumstance, but, from what has been just observed, with respect to the comparative temperature of the vapour to that of the skin, is satisfactorily accounted for; and here, with propriety, the valuable observation of Dr. Black may be adverted to, "that steam is the most faithful carrier of heat that can be conceived, as it will deposit it only on such bodies as are colder than 212°."

In some instances it may be questioned whether this exposure to heated vapour causes more exudation, or cuticular absorption; but there is reason to believe that a uniformity of effect should not be expected with reference to this part of the subject, in a variety of constitutional circumstances must necessarily occasion a diversity of results; and, when we view with wonder

the minute organizations of the skin, this must appear still more obvious.

Leeuwenhoek reasons, that, in one of the scales of the scarf skin, with which the human body is covered, there may be five hundred excretory channels, and that one grain of sand will cover two hundred and fifty scales, or, *twenty-five thousand orifices;* so that this view of the subject, if at all just, must give us an idea of their being both excessively minute and numerous; and, in their proportionate number, may be looked upon their importance, as an organization subservient to a function of great consideration.

Perspiration is technically called either *sensible* or *insensible,* the latter being in a measure constant, the other more observable, and at times much more considerable than at others; this, also, according to the climate and season of the year, men perspire more than women.

Between Keill and Sanctorius, who both wrote upon the subject, there is a difference

as to the quantity of insensible perspiration, with reference to the solid and liquid food consumed. By his experiments and observations, the former makes it amount to one half, *or rather less,* while from the patient and elaborate investigation of the latter, the insensible perspiration appears to amount to one half the assumpta; this difference must arise from the climate, and manner of living, according to the habit and usages of the countries in which the experiments were made.

" Sanctorius deserves great commendation for the prodigious pains he took in so nicely and minutely observing, for so long a space of time, the various changes of the quantity of perspiration upon different occasions.

" But is it not amazing that, in thirty years space, he should never once have thought on inhalation, or absorption from without? If inhalation or resorption is not considered, it is plain that only the apparent, not the real quantity of perspiration can be found by statical experiments.

"If, for example, the body, after ten hours, is found lighter than it was by ten ounces, without any sensible discharge, it doth not follow, that just ten ounces and no more are exhaled during that space; because, two or three ounces might have been gained in the same time, by the way of resorption, in which case the real quantity of perspiration is not ten, but twelve or thirteen ounces; so that weighing the body shews only the excess of the latter above the former, as Dr. Arbuthnot hath, and I believe the first, distinctly and explicitly taught.

"A lad at Newmarket having been almost starved, in order that he might be reduced to a proper weight for riding a match, was weighed at nine o'clock in the morning, and again at ten o'clock, and he was found to have gained near thirty ounces in the course of an hour, though he had only drank half a glass of wine in the interval.*

"A gentleman in the city was lately

Dr. Watson's Chemical Essays.

weighed before dinner, and was highly offended to find, from his weight, not long after dinner, that he must have eaten, unless some deceit was played upon him, above two pounds of beef-stakes, so much had he increased in weight.

"In the year 1779, Dr. Ingenhousz discovered that the animal body threw out azotic and fixed airs.

"In the very same year, Mr. Cruikshank, the celebrated author of a work on the absorbent system, and lecturer on anatomy in London, published a similar discovery, and, in justice to both characters, I must observe, as I heard from Dr. Ingenhousz, that their respective works were in the press at the same time. This, however, is not the only instance of two persons, ignorant of each others pursuits, happening to hit upon the same thing."

Nothing was more simple than the experiment of these philosophers; the hand was immersed under quicksilver, and the bubbles of air collected, and it was discovered

that the discharge from the surface of the body was,

1st. Two parts fixed air.
2d. One part azotic air."

In a humid atmosphere, the skin from absorption, or a deficiency of evaporation, causes a greater increase in the urinary secretion.

In the year 1759, from the barbarous and cruel sentence executed upon a wretched negro-man, by hanging him alive in chains at Charles Town, in South Carolina, a proof of absorption by the skin was afforded; he had eaten but scantily before he was hung, and had no sort of nourishment afforded him afterwards; he, however, voided a quantity of urine daily, while existing in this miserable state; the time he voided it was in the morning, the heavy evening dews having supplied the quantity.

M. Sequin and the celebrated Lavoisier bestowed great pains upon this subject; the result may be considered satisfactory, but the detail of experiments entered upon, to

come to this conclusion, would be too extensive for the bounds of this treatise; however, taking into account the fluid exudation from the lungs, and the emission of perspirable matter from the skin, it has, from the scrutiny of these philosophers, been ascertained to amount to fifty-four ounces during twenty-four hours, allowing for that difference, in this account, which naturally must arise from the temperature and condition of the atmosphere, and from a greater or less degree of exercise; hence we may conclude, that any considerable interruption to a function of such importance, must cause a very general derangement in others equally so; and, consequently, as we every day witness in our variable climate, the accession of a great variety of diseases, at once painful and obstinate. Here it may not be irrelevant to observe, that even the human passions have been, by Celsus, placed under two orders of action—the first from the circumference to the centre, and the second from

the latter to the former. Functional action, in an increased or diminished degree, has so strong a connection with these two orders of mental affections, that disease is but too frequently a consequence; while a restoration to health, in many instances, also follows in a very striking manner from this *catinated sympathy*.

The organic sympathy to which allusion is now made, and the existing chain of connection, is admirably and nicely balanced, so that, on occasions where disease commences in an internal organ, its presence is soon manifested by a deranged action on the surface, or from the surface to an internal organ; thus, the experiment of deranging the cutaneous exudation by the application of unctuous substances over the entire surface, causes diseased action in the head; from which fact, Lord Bacon tersely and shrewdly observed, "when vapour from the skin is obstructed, vapours in the head soon after ensue."

However, on a view of this part of the subject, it is a matter of great wonder that transitions from the extremes of heat to cold, and from cold to heat, are not more frequently followed by serious consequences; but the resources of the human constitution are amply provided against those exigencies, as may be strongly exemplified from what follows.

It may be observed, with respect to heat, that existing for a limited time in an apartment heated to as high a degree as 240° or 260°, caused no dangerous consequences, although the perspiration that flowed was excessive previously to a removal into the open air. This experiment, as mentioned in the Transactions of the Royal Society, some considerable time since, was tried by Sir Joseph Banks, Sir Charles Blagden, and Dr. Fordyce; and lately, in France, some young persons exposed themselves in a drying-room to its influence, where the heat was as high as 292°, with perfect

impunity — these are experimental proofs, which further shew, that heat, in an excessive degree, may be conveyed without danger to the surface, through a rarified medium; whereas a minor degree, conveyed through a denser medium, would produce fatal results.

But however wonderful these instances may appear, of the capability inherent in the constitution of sustaining heat increased to so high a degree, without subsequent mischief, the power with which the human body resists an intense degree of cold, is a subject of equal astonishment. Yet the consequences, from a partial application of heat or cold, are of a most dangerous character, when in an unaccustomed or undue degree.—In the coup de soleil we feel the direct effect of the one; and, by the other, a numerous train of disease, either directly or indirectly, are adduced.

In conditions of the atmosphere, as to its degree of heat or cold, which may be dia-

metrically opposite, a uniformity of temperature is admirably maintained, and the same degree of animal heat produced in the human constitution, notwithstanding external circumstances, otherwise existence could not be supported for any length of time.

CHAPTER V.

Division of Vapour Baths—Medicated Vapour—Aromatic and Sulphur Vapour—Gout, Rheumatism, Paralysis, and Scrofula—Mon. Rapou, Douche De Vapour—Mercurial Fumigation — Balnea Laconica — Medicated Vapour — Dr. De Carro — Medicated Vapour Baths — Vapour from Tar — Nitro-Muriatic Bath—Description of Vapour Bath—Slipper Vapour Bath.

The division of Vapour-baths into DRY and HUMID is by no means irrational or unattended with advantage, as, under different circumstances, the application of either may serve purposes in preference to the other.

Some mineral and odoriferous substances, as mercury, cinebar, sulphur, camphor, &c. &c. are made diffusible in this way, when their application would be impracticable and inefficacious under a humid form, heat acting in unison, and promoting their efficacy.

The Turks bear the alternation of heat and cold, from the use of the bath, in nearly an equal degree with the inhabitants of the northern climates; and, whether from habit, or from the effect naturally to be expected under such circumstances, the removal of many diseases to which they are subject is seldom or never expected, independant of the aid of this powerful agent. Aromatics and odoriferous ingredients are used to heighten the luxury of enjoyment, in those apartments of high temperature, which, when not frequented to excess, are both luxurious and salutary; so that, on those occasions, peculiar odours with which the vapour is impregnated, are observed to diminish diseased action, more than could be presupposed from reasoning upon abstract principles, or from any other evidence except that of experience.

Under the head of dry Vapour-bath, may be ranged fumigation from sulphurous vapour, as practised by Dr. Gales at Paris,

in the Hôpital De St. Louis, and of late introduced into this country, and practised under an improved plan by Dr. Dick, of London, and also at Brighton.

This kind of fumigation has proved of considerable utility in many cutaneous diseases found to have resisted the most active usual means, and from its effects numerous well-authenticated cases are on record, shewing its applicability and superiority in inveterate instances of this class of diseases, which occur much more frequently than is generally supposed, as, under one form or another, few individuals pass through life totally exempt from some disease of the skin.

Under the varied changes that occur in cases of gout, rheumatism, paralysis, and scrofula, the application of sulphur vapour acts as a most powerful agent, conjoined with the aid of suitable medicines, which in these obstinate complaints require a cautious and judicious administration.

Mon. Rapon, of Lyons, applies what he calls his Douche de Vapeur, in the cutaneous complaint commonly called *ring-worm*, opthalmia, some diseases of the ear, and many other local affections, with great advantage; by this means, any part may be instantly blistered with the greatest facility, which in some urgent cases is an object of important consideration.

From mercurial fumigation, a more immediate effect may be expected than can be derived from the use of this mineral externally by friction, or internally under any of its chemical combinations; and, where its influence is required to be immediate, this mode of administration will be found to have a great superiority; however, it should be most cautiously exhibited, as its administration requires both experience and the utmost circumspection with reference to constitutional peculiarities, to sanction its particular use.

The practice of exposing ulcerated parts

to the local influence of mercurial vapour, by volatilizing red sulphuretted mercury, or the submuriate of mercury, has often been successfully exercised, and from this we may judge of its great utility, upon more general application.

Previously to our improved knowledge of the use of mercury, it was not unusual, in what were called the salivation wards of our public hospitals, to place the newly-admitted patients under the blankets of those who had previously used mercurial friction; respiring this mercurial effluvia, and the use of a comparatively small quantity of mercury, soon produced a profuse ptyalism.

Under the appellation of Balnea Laconica, as used by the Greeks and Romans, the vapour was impregnated with particular medicinal plants; and such are our general sensations, as influenced by different odours, that the practice often proved successful where the effect from the heat and steam

of simple or sea-water was found inefficient; hence, in oriental countries, various vapours, from aromatic woods and balsams, from plants whose leaves and flowers and essential oils diffuse grateful and refreshing odour, are used medicinally and advantageously, as remedies in disease, or as sources of luxury and voluptuousness; this practice has the sanction of antiquity. Hippocrates used vapour, (particularly in female complaints,) charged with medicinal substances of different kinds, and modern experience every day gives further proof of its great utility.

In the military hospital at Naples, under the active and persevering hand of Assalini, between six and seven hundred patients have been cured by the application of vapour, medicated with a variety of substances; and, from the experience of Doctor De Carro, of Vienna, in cases of gout and rheumatism, the successful compared with the unsuccessful cases, by this means of cure, are as seven to one.

Mercury, sulphur, camphor, opium, the vegetable, mineral and volatile alkalies, essential oils and aromatics, have each and all their respective advantages. Some of these substances are rendered vaporific in a dry form; others require previous solution, in watery or other fluids, before this can be effected; amongst these, that most commonly in use is sea-water, which conveys in its vapour a sufficiency of sea-salt to render this bath of more general utility than vapour from heated water, although the latter, in some pulmonic diseases, (such as insipient phthisis and asthma,) may be found most suitable, as from experiment it is proved to contain less decomposable oxygen gas.

Modern experience has shewn, that the stimulus of carbonic acid gas combined with warm water, and exhibited under the form of a warm bath, is applicable to the circumstances of disease, from its action on the surface being of a particularly grateful cha-

racter. At Aix-la-Chapelle, this form of bath is now in use, and is artificially prepared at the new institution formed for the production of mineral waters at Brighton.*

The ancients had in use a kind of bath, where the body was exposed to the sun's heat for a certain time, and this upon the erroneous principle of digesting the humours; and, with a like expectation, some rude nations cover the body over with heated horse-dung, perhaps with results similar to those from the pulp of olives heated by slow fermentation, as practised in Spain.

Fumigation from the vapour of tar has, in some stages of pulmonic affections, been highly recommended; but, from its use, little should be expected, as, in cases of confirmed

* Modern chemistry has now arrived at such a degree of perfection, that, at this newly-established institution, factitious waters are made so exactly to resemble the natural waters, at the source, particularly those of Carlsbad—Ems—Marienbad—Eger—Pyrmont and Spa, that it is impossible to distinguish between what are artificial, or what are real, either from the flavour or medicinal effects.

phthisis, it is worse than useless; and, in the incipient stage, more irritation is produced than from the simple and old-fashioned method by Mudge's inhaler, on which an improvement of utility has been lately made by Dr. Cameron, of Liverpool.

As it has been strenuously contended for that a considerable effect is often produced by the nitro-muriatic bath, as introduced into practice by Dr. Scott, heated chlorine gas has been used by Mr. Wallis, of Dublin, from which results much more obvious have arisen, in cases where this vapour may have been applicable; but time and experience must hereafter more fully prove the utility of the one or the other.

For purifying hospitals, ships and prisons, vapour from the mineral acids has, from the experiments of Dr. Carmichael Smyth, been ascertained of very general utility; more particularly that of nitrous vapour, which, from many trials, was found to correct and destroy contagion in the wards of hospitals

in jails, and on board the ships of the navy.

The most simple means of procuring this vapour, is by decomposing nitre or common salt by means of sulphuric acid; the latter is put into a shallow glass saucer, placed in sand, which is kept heated by a lamp; to this is added, from time to time, powdered nitre, or common salt; the number of vessels of this description, and their situation, must be arranged according to circumstances, and the extent of the apartment to be freed from contagion.

In cases of ulceration, of a fœtid and ill-conditioned character, fumigation from nitrous vapour, both general and topical, will prove most salutary and useful.

The Electrico-Æherial baths, used formerly by Mr. Lawnds, and now upon an improved and very efficacious plan by Mr. Adams, 22, Ludgate-street, are deserving of particular attention, as the powers of the electrical apparatus are such as to command the full influence of the electrical fluid under all its forms and modifications, without the usual

difficulty and labour in its production. By this ingenious and judicious contrivance there is no effect to be derived from electricity, that is not under command, and rendered applicable to every medical purpose that may be required, with the greatest facility.

Thus far, in respect to different vapour and gaseous baths; but, as to the present mode of applying aqueous vapour, the form is both simple and efficacious, where it is intended for one person at a time. Without adverting to the grand and magnificent scale on which establishments of this nature have been formed, almost every intention may be fulfilled by the simple contrivance now in general use, which is found practically suitable to most medical purposes; and it may be observed, with great truth, that as we improve in every science or art, the means become more simple; and, with respect to the use and application of the Vapour-bath, this is constantly verified.

In an under apartment, a boiler, having

a safety valve, contains a sufficiency of water for the necessary supply;—from the centre of its semispherical cover, a tube issues to the apartment above, and opens into a hollow space eighteen inches above the floor, which is either square or circular, the surface being covered with wicker-work sufficiently strong to sustain the weight of the patient and the seat; four slight posts support a cupola, and over all is a covering of thick white woollen cloth, which is impervious to steam, and through which there are openings for the convenience of the patient and those in attendance;—through one of those, at one side, the head is easily freed from the vapour, should it prove too powerful; it is also lessened in its intensity, by a valve at the top and by a stop-cock at bottom, its further admission is regulated with facility.

When all is prepared, the vapour issues instantly into the hollow space, and gradually ascends, diffusing a genial warmth,

which is increased or diminished according to circumstances, and thus applied for a longer or shorter time, as may be deemed necessary.

Should sea-water or medicated fluid be preferred, the boiler is charged accordingly, and either for partial or general application this apparatus is found of practical utility.

The hollow space over which the wicker work is extended, is interposed between the opening of the conducting tube and the bather, to prevent the inconvenience that otherwise must arise from the heated vapour immediately issuing from below, and coming in direct contact with the lower part of the body and limbs, previously to its heat being in a certain degree diminished.

For temporary purposes, the slipper-bath lined with thick flannel may serve for applying vapour:—a tube of a proper length from a tea-kettle conveying the hot vapour, while the patient, in a flannel dress, is exposed to its influence:—this plan should be

preferred to that of conveying vapour to a patient in bed, the blankets being supported by a semi-circular wooden frame: In either case, vapour from a spirit lamp may be substituted with less inconvenience than from boiling water; and, under some conditions of disease, this spirit lamp vapour answers every purpose, it being possible to raise the temperature to any necessary degree.

In cases of suspended animation from drowning, or other causes where this remedy is quickly required, this may probably be considered as one of the most simple and expeditious means of conveying heat.

Mr. Wood, of Brighton, formerly of London, whose ingenuity has contrived one of the best means of preserving ships on long voyages from leakage and the worm, by the interposition of FELT between the planks, has suggested the utility of using a dress completely enveloping the body and limbs, composed of soft thick woollen FELT—hollow tins, formed so as to cover the chest and ab-

domen—the limbs and soals of the feet are filled with boiling water, and placed over the felt :—From these, a genial warmth is instantly conveyed through the felt to the surface, and kept up for any necessary time, by renewing the hot water.

Under circumstances of local inflammation, either for the purposes of a topical fomentation, to promote absorption or suppuration, the use of FELT and heat conveyed from hot water within the tin, may be found more suitable than the usual means now practised, and the application of cataplasms.

CHAPTER VI.

Doctor Gower's Tracts—Spirit Lamp Vapour Bath—Warm Bath heated from Vapour—Baths on extensive Scale—Shampooing.

Dr. Charles Gower, of London, in his tracts descriptive of the auxiliaries to medicine, has given a plan of the spirit lamp Vapour-bath or sudatorium, with an illustration by a plate.

The annexed engraving represents a domestic sudatorium, which is heated by a spirit lamp, and, therefore, may be called a Spirit lamp Vapour-bath.

On the surface of a mattress, in Fig. I., the patient is represented horizontally at full length, in the most easy position for remaining during the use of the bath:—over the patient is placed a frame of basket-work, being of a light material, and suited to sustain a thick covering lined with oil-cloth, so as to retain the vapour, and at the same time

prevent the moisture from penetrating the bed-clothes:—at the end of the frame, at *a*, a tube enters, through which the vapour is conveyed:—this tube is formed of tin-plate, and, instead of being soldered, is grooved at the joint, as the heat in passing through the tube would be so intense as to separate the soldering:—this tube should be of sufficient length to obviate the inconvenience which the heat of the vapour (being more than sufficient,) might occasion.

The lamp being nearly filled with spirit of wine, the wick set fire to, the top to which the tube is fitted being adjusted, the air which enters the tube is heated with great rapidity.

Figure II. represents the lamp upon an enlarged scale, with perforations through the top, for the admission of a current of air, immediately over the flame, by which means it becomes heated and rarified in a sufficient degree for the desired purpose.

In order more perfectly to understand the

whole of this contrivance, it is necessary to observe that the cradle forms, when placed over the patient, a hollow chamber, which is rendered air-tight in a sufficient degree, by tucking the covering around, leaving it optional in the patient to place his head within the cavity, or withdraw it at pleasure.

The following description of the cradle, as recommended by Dr. Gower, will serve in the most essential particulars for that in Fig. I. — "The cradle is made of longitudinal bars of ozier, placed at the distance of an inch or more asunder, and preserved in their situation by occasional cross bands of basket work. The shape may be compared to the half of a truncated cone, divided in a direction from the apex to the base, its length being *four feet four inches*, its main width at the base, which covers the patient's shoulders, *two feet*, and the smaller end only *one foot five inches*.

"Within the edges of the narrow end is

laced a thin piece of board, by means of young and pliant oziers, passed through perforations for that purpose, and worked into the cradle; and a circular orifice is made in the centre of the board, or a little below it, for the admission of the point of the curved tube, so that it may be tightly fitted to its diameter."—The tube in Dr. Gower's sudatorium is curved, and formed of tin-plate, grooved and made to rest upon the lamp, which is placed upon the floor of the chamber; and, in place of the perforations being in the top of the lamp, they are made through the lowest part of the tube, a little above the part at which it is joined to the lamp:—The tube from the bottom to where it is inserted into the lower part of the cradle is thirty inches, which is of sufficient length to prevent the air being too hot on coming in contact with the patient. In some particulars, the lamp with the spirit of wine could be caused to burn without a wick or wicks, which are in a great degree unneces-

Fig. 1st

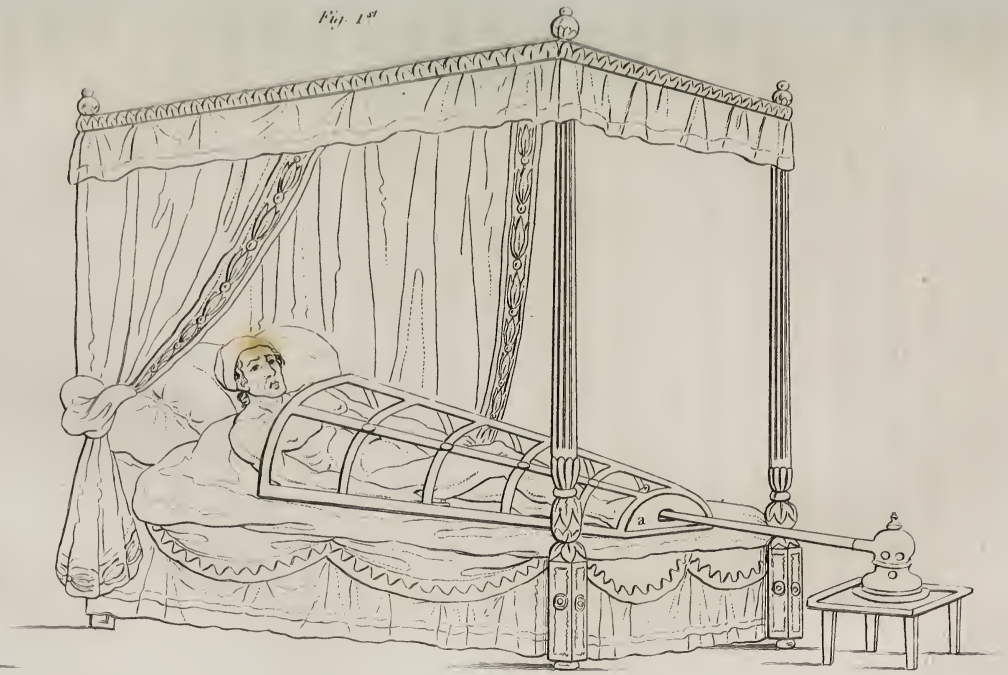
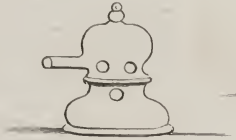


Fig. 2d



THE SPIRIT LAMP VAPOUR BATH.

Neele & Stockley, sc. 352, Strand.

sary, and indeed the spirit of wine seems to act without them, besides admitting of a quick and certain extinction, by the aid of a cover or extinguisher, as soon as the operation is finished."*

The patient should be wrapped in flannel or a blanket, and in this way profuse sweating may be obtained at the heat of 85° of Fahrenheit, more effectually in many cases than at a higher temperature; indeed, a bed heated to a certain degree by the usual means, which heat being kept up for a much longer time than usual, constitutes a simple dry Vapour-bath of no small efficacy.

From what has been mentioned, respecting the necessary quantum of heat to reduce water into vapour, and the rapidity with which vapour imparts its heat to colder bodies, a warm fresh or sea-water bath may

* The whole of the articles for a sudatorium may be had of Mr. Dedrick Smith, Tin-plate-worker, 14, Gerrard-street, Soho; or of Moser, and Co., 52, Frith-street, Soho, London.

be very quickly prepared, by heated vapour being conducted through a tube, first perpendicularly ascending along the outside of the bath, and then carried downwards under the lower stratum of the water.

Upon a more enlarged and general scale, where expence is not a consideration in comparison to their great utility, baths have been erected, which afford an ample and convenient means of exhibiting this remedy.

A vast deal is due by the public to the Honourable Basil Cochrane, who, at a great expence, has erected baths upon a grand scale, at his residence, Portman-square, London; and who, from the advantage he experienced in his own person from the use of the Vapour-bath, has been at very great pains and expence to render this means of relief as general as possible, and through whose meritorious efforts many have derived most signal advantage. Baths on an extensive scale, where a limited number of persons may be exposed to vapour at the same

time, in apartments formed for that purpose, are more luxurious and agreeable, as the space admits of a free and more unconfined respiration.

Should the application of vapour in disease become a national object, no means, upon an enlarged plan, can suit better than that of the gentleman just mentioned, which, at the same time, comprises the application of steam to a variety of purposes necessary in a domestic or public institution.

Thus far as to what relates to the different kinds and modifications of Vapour-baths; and, as in some measure connected with the subject, as generally practised when this remedy is most in use, some account of the process of shampooing should be adverted to; for if, from accident or from disease, local complaints should require friction, this process is frequently succeeded by advantageous consequences not to be obtained from other means, and not unfrequently verifies an observation of Sir William Temple, that

a man who could keep a slave to rub him, need never have the gout.

SHAMPOOING.

This operation which, as before stated, is in Egypt called MASSING, although simple and strictly speaking, a process of friction and extension of the tendons and ligaments, requires practice and dexterity to perform it with comfort and utility to the patient.

In India, where each domestic's employment is specifically assigned, persons are instructed in the art, and prized in proportion to the facility and dexterity with which they perform it; and which, from early infancy, is practised upon children and persons of all ages, rendering their joints supple, and their muscles elastic.

After exposure to the bath, while the body is yet warm from the effects of the vapour, the shampooman proceeds, according to the circumstances of the case, from gentle fric-

tion, gradually increased to pressure, along the fleshy and tendinous parts of the limb; —he kneads and grasps the muscle repeatedly, presses with the points of his fingers along its course, and then follows friction in a greater or less degree, alternating one with the other, while the hand is smeared with a medicated oil, in the specific influence of which the operator has considerable confidence. This process is continued for a shorter or a longer space of time, and, according to circumstances, is either succeeded or preceded by an extension of the capsular ligament of each joint, from the larger to the smaller, causing each to crack, so as to be distinctly heard, which also succeeds from the process being extended to each connecting ligament of the vertebre of the back and loins. The sensation at the moment is far from agreeable, but is succeeded by effects not dissimilar to what arises from brisk electrical sparks taken from the joints in quick succession.

This operation upon the articulations of the limbs, is much less frequently repeated than the other parts of the process of Shampooing, and in its effects on disease must be considered as generally unnecessary and often mischievous ; — but this should not be said of friction, from which, by ancient usage as well as modern experience, we are instructed how much can be derived when practised with judgment and *patient perseverance :* — the Indians, who hold it in high estimation as a means of relief from the consequences of excessive fatigue and from unusual bodily exertion, have constant recourse to it, and from its soothing effects sleep is often induced where the usual means fail.

CHAPTER VII.

Friction, by Mr. Pugh—Friction—Percussion—Pulsator, Dr. Gower—Simple Means from Improvement in Vapour Bath—Application of Vapour Bath—Accession of Disease—General Application of Vapour Bath—Productive of Longevity—Applicable to great Variety of Disease.

Some years since a Mr. Pugh, a Surgeon in London, practised the art of friction on diseased limbs, with considerable success. Being a good anatomist, and particularly well-informed as to the origin and insertion of muscles, his mode of friction was conducted accordingly, and much advantage followed from his practice; since his time, Mr. Grosvenor's plan, as exercised under his immediate direction, and pretty generally by others agreeably to his mode, has been found of the greatest utility, where other means failed, or proved only partially useful.

Many years ago, the practice of percussion and compression, for the cure of gout

and rheumatic affections, was brought into notice by Admiral Henry, from its efficacy upon himself, and from its having been mentioned in the Medical Guide, and Medical Spectator. Sir John Sinclair becoming acquainted with its use, published a pamphlet upon the subject. Latterly, this practice is actively employed by Dr. Belfour, of Edinburgh, in many other diseases, and report speaks most favourably of the result. Under this head should be noticed another short tract, respecting an instrument which he calls a pulsator, written by Dr. Gower, intended to act on diseased parts by percussion, and of which, previous to describing the instrument, he gives the following judicious observations: "It has been an established practice, traceable from a period as ancient as that of Hippocrates, to give aid to such parts of the human body as are enfeebled or under suffering, by *mechanically propelling the too languid circulation of the fluids.*"

" Different nations seem to have employed different means for the performance of this salutary custom. By a portion of the inhabitants of India, and by some of those who dwell in parts of the globe discovered by Captain Cook, the principles of the usage are maintained by the well-known process of *shampooing;* and a method nearly similar, termed *massing,* is stated by Dr. Larrey to prevail amongst the people of modern Egypt. But to trace the practice further back, and to an age more polished, and more known by the written documents which we possess, there is a whole chapter in the second book of Celsus, *(De Medicina)* which treats especially upon *friction.* He mentions, that it is performed 'by the *hand,*' and that inveterate pains of the head are mitigated by the *friction* of *it,* (yet not during their violence;) and any paralytic limb is strengthened by rubbing it.

" To adduce a pretty strong proof of the high estimation in which this custom was

held by Celsus, he is more than ordinarily strenuous in his desire of giving the invention to its genuine founder:—his expressions, as applied to Asclepiades, who laid claim to the merit of the thing, are—'Now, as it is not fit to defraud the moderns of the merit either of their own discoveries or judicious imitations, *so it is but just,* at the same time, to assign those things which were practised among some of the ancients to their true authors.

"'It cannot indeed be doubted, that Asclepiades has been both fuller and clearer in his directions, when and how friction ought to be used; but he has discovered nothing which was not comprised in a few words by the most ancient author, Hippocrates, who said, that *friction,* if violent, hardens the body; if gentle, softens it; if plentiful, extenuates it; if moderate, increases its bulk. From whence it follows, that it is to be made use of when a lax body requires to be braced; or to soften one that is indu-

rated ; or to dissipate where fullness is hurtful ; or to nourish that which is slender and infirm.'

"Close attention to the principles on which this ancient practice is founded, and the consideration of the good effects which are experienced from its usage in rheumatic affections, have gradually led to the construction of an *instrument* whereby the operation may be effectually conducted without much previous skill.

"Something more may reasonably be expected to arise from the propulsive force of an instrument, than from the action of a bare hand. The former partakes of the nature of percussion, and can therefore act on parts which are deeply seated ; whilst the latter is confined to friction alone, and is too superficial to remove those pains which afflict the under layer of muscles.

"And there is a material advantage, moreover, in the power which is granted to the patient, to become his own operator, be-

cause he can adjust the precise force which he is enabled to bear, and he can also increase the rapidity of the process proportionate to his sensation of heat, and to the consequent motion of the fluids of the affected part.

" From the conjoint effects of such an instrument, and of the dry-bath, mentioned in the former tract, there is a strong probability of relief being afforded to numerous cases, which have hitherto failed to yield to baths of warm water, to stimulating liniments, and to the repetition even of blisters.

" As a proper medium to be employed in the formation of the *pulsator*, it has been determined to make use of cork, not alone on account of the extreme lightness, but from the elasticity and less consequent tendency to irritate. Some difficulty was at first experienced in giving that due firmness to the handle which the operation required, without depriving the cork of its more valuable properties. If the latter had been per-

forated for that purpose, it would have been found of too pulverable a nature to admit of a steady pressure, and the effects would have been deficient. Upon reflecting, therefore, on all the possible methods which could be adopted, that *one* has been selected which is here brought before the view of the reader."

EXPLANATION OF THE SEVERAL PARTS OF THE PULSATOR.

"The letter C is the cork, measuring two inches in depth, and manufactured out of the best Spanish materials. Its diameter is adapted to the diameter of the

brass collar A; which, being formed of two pieces united by a hinge, and terminating in a male screw, is readily affixed to its handle, taking the general appearance of the letter B.*

"The handle is made of mahogany, stained black, to resemble ebony; it has a ferrule of brass attached to the end, near to the cork, in which is a female screw, whereby the collar is made to embrace the cork firmly, and to retain it in its grasp. With the weight of all the parts together, those instruments which have been hitherto made have rarely exceeded two ounces and a half avoirdupois, and their appearance is extremely neat.

"Perhaps it may be desirable, by the derear, to be informed of the method which was pursued in the formation of the instrument after various trials. The diameter of a brass collar having been ascertained out of the mass of those which were cast in the same mould, an admeasurement by callipers was taken, admitting of a trifling enlargement beyond the precise calibre of the ring. This over-measurement allowed of that nice reduction which

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* One of the most intelligent cork-cutters in the trade, is Mr. J. Bucknall, senior, of the firm Bucknall and Sons, No. 5, Crutched Friars, London, from whom much information has been collected concerning the best mode of forming and polishing the cork, to adapt it exactly to the brass collar of the instrument.

the adaptation to the collar demanded, leaving, however, a full pinch upon the cork; and this was gradually performed by a piece of pumice, used after the manner of a fine file, which it greatly exceeds in effect, in this case, especially when sharpened occasionally by rubbing one piece of pumice upon another.

"To this it will be an improvement to add, that, if a small hole be drilled in the brass ferrule, belonging to the handle, either for the admission of a rivet, or a delicate screw, it will keep the handle firm to its duty—griping the cork closely, and preventing its getting loose at any time."

APPLICATION OF VAPOUR BATH.

This digression was requisite previously to entering upon the consideration of the use of vapour in particular diseases, and it is here also necessary to premise, that a clear distinction should be made between its general effects and that of the warm fluid bath, for, although their influence upon general principles may be looked upon as pretty similar, yet it should be considered, that the specific gravity of the one and the

other being very different, the results may naturally be expected to differ also.

Under this head, agreeably to the plan of this Treatise, the observations must be general, but, at the same time, sufficient to specify the danger to be avoided, or the advantages to be hoped for, under certain circumstances.

All direct applications to the surface of the body, whether as to quality, temperature, or tenuity, have their influence upon the two principal functions of animal life, the general circulation and nervous vitality; and through this medium, upon the brain, stomach, lungs, and viscera.

In those important organs disease soon follows, upon any considerable deviation from their well-being, and speedily manifests itself under one form or another: from this painful and distressing feelings soon arise, and hence the ancients, with justice, designated the organs of sensation the sentinels of health.

From this view of what arises in the system, under a direct action on the surface, we become, in a measure, acquainted with what commences there, and centers internally.

This may apply as to health, or a deviation from it, in which a considerable variety of disease may follow from modifications of the same cause; yet each form is so allied to another, as to account for so general a remedy as the Vapour Bath having a salutary effect upon each in its distinct character.

Its action kindly solicits the fluids to the surface, and at once frees the circulation, and sooths the sensations, so that relief may be expected, where a disordered condition of either has for any time existed; for the vital organs being but too frequently in a morbid state, from unhealthy cutaneous action, it may be truly said, that the influence of cold in producing disease is not greater than that of heat, under the form of vapour, in mitigating and removing its baneful consequences.

By a regular and periodical use of the Vapour Bath, the inroads of time and old age upon the constitution may be diminished, as they invariably extend from the surface to the internal organs of life; and by vapour, as a new power, existence may become comfortable, and longevity more secure.

By its proper application, it will be found useful and efficacious in those cutaneous complaints so generally known, and which add to the intensity of the other affections with which they chance to be conjoined, and from so extensive an outlet as that of the skin, are soon mitigated; also, in many of our most formidable chronic diseases, such as gout, in most of its varieties, rheumatism, paralytic affections, hydropsic complaints, diabetes, female obstructions, scrofula and glandular diseases, dysenteria, congestions and obstructions of the liver and spleen, occasioning their torpor, and the diseases that follow in a connected chain with the stomach and alimentary canal; on

the condition of which the healthy or unhealthy state of the whole animal œconomy has so direct and considerable a dependance, and on which the primary effects of all internal remedies must be exercised before their influence can be diffused over the general system.

To the above enumeration we should not omit febrile diseases, under the modifications of typhus and intermittents, and certain conditions of scarlet fever, where vital reaction is oppressed with disease and considerable debility; here, from the difficulty of moving the patient, vapour from the spirit-lamp will prove most suitable, as has been described in the foregoing part of this treatise.

CHAPTER VIII.

Diseases to which Vapour Bath is applicable—Caution necessary in its Use—Commence with Vapour of Low Temperature—General Precautions—Time for entering the Vapour Bath—General Instructions—Necessary Caution—Application in Gout—Salutary Effects in Gout — Gout—Rheumatism—Lumbago—Sciatica—Dry Pumping—Alternation of Baths—Rheumatism.

In hypocondriases, epilepsy, tetanus, nephritic and other diseased conditions of the bladder, in hysterical affections, and those dependant upon what is termed nervous debility, attended with continued or periodical head-ache, this simple process proves useful, by removing congestions, by exciting the superficial blood-vessels, and promoting excretion and secretion, which are so essential to animal existence. Where obstructions of the principal viscera exist, from which other serious diseases, such, for example, as dropsy, indigestion, obstinate

constipation, irregularity in those functions appertaining to females; jaundice, chronic affections of the head and chest, and many anomalous complaints, which are difficult to classify, great care should be taken to ascertain whether local or general bleeding, together with purgatives and deobstruents, should not precede the active use of the Vapour Bath; for on this subject experience has, in many instances, instructed us, that much mischief, and considerable danger, has arisen from a want of the necessary precaution; and a remedy, in itself of very great value and importance, has but too often suffered in its character, by invalids entering upon its use without due consideration and circumspection—this observation, in a general sense, should be understood with reference to almost every case submitted to its influence; holding in view, that, as it is a powerful means of relief, the discretion necessary to its administration should be considerable.

Having, in this general consideration of its effects, suggested under that view what may be deemed requisite, it remains to particularise some complaints in which the Vapour Bath has been used with great advantage; but, it may not be unnecessary here to state, that, as a small portion of vapour is capable of imparting heat in *considerable quantity*, as experimentally accounted for in a previous part of this Treatise, we should commence with vapour of a lower degree of temperature than that required, and admit it into the bath, of a heat gradually increasing up to the proper standard; this may extend from 96° to 150°, beginning very slowly and with caution; it will thus act as a most agreeable stimulus without irritation.

In full habits, and even where this may not be the case, depletion by bleeding, cupping, or leeching, can seldom be dispensed with, where habitual constipation is an attendant upon the disease; this should

be obviated by an appropriate plan, and attentively persevered in during the whole course of using the bath, and with it an abstemious and regular course of diet. Indeed temperance, as to food and wine, must be enjoined, early hours attended to, and punctuality as to time of meals and exercise strictly observed.

Those who indulge in the luxuries of the table, and in more than a very moderate quantity of wine, will derive a comparatively inconsiderable share of advantage, to what may be expected from a different observance.

With respect to the hour of the day or night, at which the Vapour Bath may be most appropriate, much will depend upon the constitution of the person, and upon those circumstances of disease for which it may be required; these circumstances are so various that general rules must suffice, as the particular symptoms of each disease would otherwise require endless observation.

The general time for entering the bath should be about an hour and half before dinner, under certain circumstances before breakfast, and from fifteen to thirty minutes will be a sufficient period for remaining in it.

When considerable debility is present, and when the effect from perspiration is not expected or wished to succeed to its use, the morning or the afternoon, some time before dinner, is the most suitable period, and, in this case, it is necessary to commence at a low degree of heat, which should be gradually increased; this rule also holds good where vapour is used as a bath immediately before retiring to rest, when perspiration may be expected to follow, and then it may be necessary to continue in it for a longer space of time than usual.

Should one of the consequences of using the bath at this time be fever, with head-ache, restlessness, heat, and thirst, the time for its use must be altered, or some previous step taken to cause it to act with more salutary

influence; when a flow of perspiration, in most cases, follows, with great facility, in which effect it seldom fails; but, on those occasions, an unnecessary quantity of bed-cloaths often proves not only uncomfortable, but injurious, producing heat, fever, and head-ache; this practice should consequently be avoided.

During the period of using a course of Vapour-bathing, the bowels should be soluble, the diet light and nourishing, and early hours carefully attended to.

On first entering upon the use of the Vapour-bath, it may be found to disagree; but, by perseverance, this consequence often disappears, and, by one modification or another, it in general will be found a most active means of relief.

During the winter months, patients should be cautious in being cold or chilly immediately before entering into the bath; to obviate which, brisk exercise, for some time previously, will serve the best purpose; on the contrary, in the warm season, their

blood, from one cause or another, should not be overheated; extremes, under such circumstances, but too frequently counteract the advantageous consequences that might otherwise ensue; it is proper to observe, that it is much more prudent and wise to use the necessary precautions against cold after an exposure to vapour, than to immediately hazard any risque. This caution applies more to women and children than to men, whose constitutions differ so very materially from those more delicately formed. The Vapour-bath, when favourably applied, occasions the cutaneous glands to throw forth, on the surface, whatever foul matter may obstruct the free exit of perspiration; while, by subsequent ablution with soap and warm water instantly applied, the sordes are most effectually removed, leaving the skin smooth, and its transpiration unimpeded; a sense of comfort and vigour is thus imparted, and the vital and animal functions performed with strength and energy.

GOUT.

In gouty cases, of a chronic, or even recent character, the Vapour-bath, with few exceptions, will prove salutary.

This disease, with which indigestion and obstruction are never unconnected, requires great variation in the treatment, according to its different stages, and other circumstances, dependant on constitutional peculiarities; but a most useful adjuvant will be found in the Vapour-bath, where those means are used which are known to act in unison with it.

With this end in view it is necessary, in every case, to attend most particularly to the secretion of the liver and kidnies, and also to the functions of the intestinal canal, as well as to the degree of symptomatic fever existing, choosing with judgment the most favourable time for its administration, which, in every instance in which chronic inflam-

mation exists, in any viscera, must be considered as highly injudicious.

Gout is a disease in which, from the variable character it assumes, and from the fatal consequences arising from erroneous treatment in the school of quackery, many have been deterred from the use of any means of relief, leaving the event to the efforts of nature; while others, when suffering under excessive pain, fly to every nostrum with indiscriminating temerity; amongst others, heating carminatives and tonics, conjoined with opiates, disguised under one form or another, using, at the same moment, external applications to those painful and inflamed parts, which indicate internal and general disease, on which topical remedies can have no effect, except in perverting a salutary solution of the disease, or perhaps inducing a sudden and dangerous termination, a record of which may never reach the public eye, like many similar results from the practice of empirics.

Lord L——w suffered for many years under frequent attacks of gout, and, finding considerable relief repeatedly from placing his feet and legs in cold water, continued to do so whenever much pain accompanied the paroxysm. As he advanced in life, he did not discontinue the practice, but used it less often.

Being upwards of seventy years old, on the accession of an attack attended with violent pain and inflammation in both feet, he used his old remedy, but it induced a diarrhœa which terminated his existence.

In respect to the alleviation or cure of gout, both from its history and nature, the Vapour-bath may be viewed as an agent of great consequence, more particularly when internal congestion is previously diminished in those of a full habit, or where, in a nervous temperament, the morbid appearance of the tongue and feverish pulse are wholly, or in part, removed.

By warmth, under the form of vapour, the action on the skin is so improved, that

the function of absorption is performed with greater facility, and a solution of the paroxysm so effected, as to render its recurrence less frequent, and less in degree; but, with all this, a system of temperance must be resolutely entered upon, and as strictly adhered to, otherwise the good to be expected from the means we speak of, will be found to fall far short of our hopes and expectations; and, under this view, it has not been unaptly observed that, if gouty patients would at times pursue a course of abstinence, equal in continuance to that which a gouty fit forces on many, great advantage might be the result, particularly in conjunction with suitable remedies. The best time of year for putting in practice a prophylactic plan of this kind, would be at the commencement of the spring and autumn; but at all times, and at all seasons, those of a gouty habit should have temperance in eating and in drinking, as their leading star.

Using the Vapour-bath in gouty cases, when the stomach is most empty, often succeeds, when a different practice proves unavailing; when taken before breakfast, this frequently happens, and, from the history of the disease, according to the best-received opinions of its character and symptoms, this might naturally have been expected, was it not that the remains of a dangerous and false theory, founded upon the *humoral pathology*, still exists in the minds of both patients and practitioners.

Amongst the few cases that I mean to state, to avoid a practice but too common to delude and deceive, may be mentioned that of Wm. P——o, Esq. who, for this disease, used ineffectually both warm and Vapour-baths, in the evening and at night, for three successive seasons, and, by a course of the latter, under proper regulation, in the morning before breakfast, was effectually and I hope permanently relieved.

In most gouty cases, Vapour from sea-

water is better suited than from fresh water; but, in many cases of rheumatism, the latter answers every good purpose.

RHEUMATISM.

This disease is strictly allied to gout, and, although differing in some essential symptoms, is also very much mitigated, and, indeed, the habit of the disease removed, when, with other means and proper regimen, the Vapour-bath is judiciously applied.

Where it is combined with gout, it generally is more intractable than under other circumstances; and, as the use of the lancet is often required, the blood will be, (should increased vascular action be present,) more frequently in what is considered an inflamed state, than in gout; yet this observation must be received more in a general than in a particular sense; however, with respect to the Vapour-bath, the evacuation of blood may be of such essential consequence, that the advantage from it may

entirely depend upon this previous step; in the acute rheumatism, no advantage can be expected until the inflammatory symptoms are, in a great measure, subdued; and, in no disease, can this desirable end be attained with more difficulty.

Rheumatism, in one respect, and a principal one, differs materially from gout; in the latter, as before observed, internal causes are found to have a great share in its production, but, to external causes acting on the surface, and in a secondary manner, on the membraneous part of the larger articulations, and on the fasciæ of muscles, are we to look for the production of rheumatism; this distinction as to causes is of importance, with reference to the treatment of each disease, in their different stages.

In various degrees of Chronic Rheumatism the most desirable results have ensued from a judicious application of the Vapour-bath, particularly in the common lumbago and sciatica, and, indeed, it may be looked upon

as a means of the very best description, when persisted in with steadiness and judgment; but it is a matter of moment, should the wind prevail from the north or north-east, during the time of using it (for the relief of this disease or of gout,) to be cautious in avoiding the danger of a chill, which might not only prevent its good effects, but induce an affection of the chest, of a tedious and troublesome character.

A gentleman, affected with a confirmed rheumatic complaint of some standing, suffered also from symptoms indicating a diseased condition of his heart, which occasioned some hesitation respecting the propriety of using the Vapour-bath as a means of relief, under such circumstances.

He, however, required that the experiment should be tried, and both the rheumatic complaint, and the affection of his heart, were completely removed by a perseverance in its use for some time.

In aid of this means of relief, the warm

Douche, or as a substitute dry pumping, as it is termed, may immediately precede or succeed to its use, but what in general more effectually succeeds is the direction of the steam to those parts most affected, under the form of a *Douche de Vapeur*.

The alternation of a cold sea-water bath, succeeding immediately after the warm or Vapour bath, in some obstinate rheumatic cases, has proved very useful; but, although this practice is very common in Turkey, and in Russia, &c. our present habits of bathing will not, without further experience, sufficiently warrant its adoption, except where the usual means fail, and where some specific indication prompts its trial.

Where this disease affects the back and loins, extending along one or both of the lower extremities, the alternate use of the warm and Vapour-bath, succeeded by friction or shampooing, is often a means of great relief, and attended with the happiest results. Friction, judiciously applied by the use

of the flesh-brush, woollen or camel-hair-glove, or by the naked hand, for a certain time each day, assists considerably in aid of the good effects from the bath, which should be reiterated day after day, in painful and obstinate cases; and, in those of a more common nature, friction is less often requisite.

CHAPTER IX.

Paralytic Affections—Paralysis—Rheumatism—Painter's Cholic — Hydropic Diseases—Bleeding in Dropsy — Hæmorrhage, Dr. Parry—Hydropic Complaints—Diseased Kidneys and Bladder — Scrofula—Mesenteric Scrofula — Pulmonic Affections—Hip Joint—Glandular Swellings—White Swellings — In Luxations and Injuries — Cutaneous Diseases — Visceral Diseases.

PARALYTIC AFFECTIONS

Arise from causes so obscure, that it is a matter of the utmost difficulty, at times, to form any just opinion of their origin, which, however, is not unlike to those producing gout and other diseases affecting the extremities; and it is a melancholy truth that many of these affections, notwithstanding every effort to the contrary, prove both tedious and obstinate.

Their pathology, as in the two preceding diseases, is such as to authorize the use of

the Vapour-bath with a promise of as much benefit as from any other remedy, provided the necessary general and local depletion, with suitable regimen, have been previously put in practice. If so, its salutary action upon the skin equalizes the circulation, and often, in a most admirable manner, restores the suspended nervous functions, and the lost and regular power of muscular action.

Children, under five years old, are subject to a species of paralysis, which, arising from a peculiar state of the alimentary canal, sometimes accompanied with worms, produces an irregular state of the flexor muscles in the hands and arms, and at times renders the lower extremities nearly powerless. In conjunction with the use of cathartics, and an alterative plan, the warm and Vapour-bath, under such-like circumstances, assist materially towards the removal of the disease.

It should not, however, be disguised, that in every species of paralysis, disappointment

often ensues, notwithstanding the number of instances that can be put forth as proofs in favour of this remedy, which should be used both partially and generally for a long continuance, suspending its use at intervals, and again and again resuming its application, while any promise of amendment remains.

In the case of M. Spicer, of this town, aged 34, the lower extremities continued paralized for many months—an enlargement and induration of her liver was perceptible on examination.

The latter was removed by the influence of mercury and purgatives; and, subsequently, the paralytic affection of her limbs was totally removed—in this case, the Vapour-bath was not used.

External causes, as those arising from the fumes of lead, mercury, &c. &c. to which manufacturers in those metals are exposed, induce paralysis of the alimentary canal, under the form of what is called the painter's cholic, which is often followed by irregula-

rity in the voluntary action, or total deprivation of muscular power in different parts of the body ;—manifesting, under a morbid condition, that sympathetic and wonderful connection existing between the secretions on the surface, and in the interior, and their reciprocity of action.

In these cases, the Vapour-bath often succeeds in the happiest manner, and is very much aided by the alternate influence of electricity ; at the same time requiring appropriate medicine, regularity of the bowels, and a careful attention to regimen and diet.

HYDROPIC DISEASES.

Under this head, a great variety are included, which admit of no *general* mode of treatment, but requiring the action of remedies according to their causes and circumstances.

The causes are manifold, and those of the most serious consideration have their origin

in inflammation, obstruction, and what is technically termed congestion of some internal organ, on which the well-being of animal life depends.

From all this, it must be inferred, that to presume upon a favourable result and permanent relief from the Vapour-bath in these diseases, considerable pains should previously be taken to strike at the root of the evil.

More than twenty years since, Dr. Rush, of Philadelphia, used blood-letting in many cases of dropsy successfully, and on previviously just conclusions; and, since then, Dr. Blackhall has given further strength to the practice, which has been exercised by many with similar results; among the number, the author of this statement has had strong practical proofs, in many cases, of its excellent effects.

The Reverend Mr. H. ——n, aged 26, laboured under general anasaria to a considerable extent. In concert with his sur-

geon, Mr. Verral, of Seaford, it was determined upon, that venesection should be freely used — it was repeated again and again, and we soon after had the satisfaction of witnessing a complete recovery.

In the commencement of these diseases, an increased momentum of blood can generally be traced, preceding the hydropic symptoms; and Dr. Parry has, with great perspicuity, in his Elements of Pathology, proved the connection, and the consequences.

Speaking of hæmorrhage, and its alternating with dropsy, he says, "Were any thing wanting to prove the vicarious relation of dropsy and hæmorrhage, sufficient proof might be found in the fact which I have more than once witnessed, of violent, long-continued, and most extensive anasaria, immediately, completely, and permanently cured, by spontaneous hæmorrhage;"—such are the efforts made by nature, where the functions of life are clogged and impeded,

and such are the lessons from which science and art derive instruction.

Under the head of dropsical diseases, it may here be added, that after necessary topical evacuation of blood during the commencement of hydrocephalus, and the other customary means, the Vapour-bath may be used with safety and probable advantage, from its influence on febrile action, and in promoting absorption and secretion;—on this principle, in all hydropic complaints, it will be found a most powerful adjuvant in promoting the salutary powers of diuretics, purgatives, &c.; and in giving an active effect to mercurial preparations.

Where exercise is admissible, or rather practicable, in hydropic complaints, it should be taken to as great an extent as the case will admit of, particularly previously to the use of each bath, and for some time after, except the weather will not permit;—this is enjoined for obvious reasons, but more particularly with a view towards the salutary action of the absorbent system.

Diseases of the kidneys and bladder may be considered more as symptomatic of gout, rheumatism, paralysis, &c. &c. than as morbid conditions of an idiopathic character, and if found referable to any of these heads, should be treated accordingly.

Where the seat of the disease is in the kidneys, and inflammation existing, or where this takes place in the bladder, general and topical bleeding, to a great extent, must be practised before any expectation of advantage can be entertained from either the warm or Vapour-bath.

In chronic diseases of these important organs, the Vapour-bath affords very great relief;—its action on the skin generally inducing by sympathy a favourable change in the secretion of the mucous membrane, and assisting towards the restoration of the natural and healthy function, deviations from which are the cause of the diseases termed stone and gravel, with their various appearances and modifications.

In that formidable and painful disease to

which is given the name catarrhus visicæ, in which a diseased prostate gland but too often participates, and in which the urine abounds with a purulent mucous admixture, causing a most constant desire to pass water, the Vapour-bath has afforded most particular and permanent relief, to the comfort of the patient, and often to the astonishment of the practitioner.

Mr. M——n had used mercurial preparations to excess, and his urine became loaded with purulent mucous, accompanied with pain in voiding it; under the hands of a junior practitioner, he continued using mercury from a supposition that his disease had extended to his bladder.

On ceasing from its use, betaking himself to a change of air, and using warm bathing, he was soon restored.

SCROFULA.

Scrofulous diseases of the head, of the lungs, of the mesentery, of the joints, and of

the spine, with all the shades of this varying and perplexing disorder, are so formidable, and so obstinate, that we seek with avidity for any promise of relief, especially as the subjects of attack are frequently the most interesting, most beautiful, and most marked for acuteness of intellect and sweetness of disposition, that can be found among our youth of either sex.

There are stages of scrofula in which, at times, the cold bath, at others the warm bath, and certain conditions of the disease, when the influence from warm vapour, judiciously applied, will prove more appropriate; circumstances under one form will forbid what may be proper under another, and with reference to the bath, whether cold, warm, or vapour, it requires much judgment and experience to fix upon what may be most suitable.

During the existence of tumefaction of the abdomen, whether arising from mesenteric disease, or from obstructed viscera, means of

subduing these symptoms should be tried, prior to the use of the Vapour-bath, or in conjunction with it, alternating with that or the warm bath, when either of these diseases undergoes some diminution.

As in some degree connected with diseases of this character, a very painful chronic affection of the abdomen should be mentioned, on which Dr. Baron, of Gloucester, has written with great perspicuity; he traces its organ to hydatids, and, from insidious and imperceptible degrees, it at length becomes both painful and intractable, the abdomen assuming the appearance of a solid tumor, which is to be distinguished from mesenteric obstruction by a sensation of *broiling heat*, in addition to violent pain.

Symptomatic fever, great thirst, unusual emaciation and obstruction, closing the channels of nutrition, terminate a disease generally fatal.

After death, "on opening the belly, it was found that the whole of its contents adhered

to each other, and to the cavity, in such a manner as to form apparently one solid mass."

The ambiguity that at one time attached to the Vapour-bath in PULMONIC AFFECTIONS, is much less than formerly, and cautiously applied, it will be found of great utility; but where there exists much symptomatic fever, or inflammatory action, it should not be used, or at least great circumspection is required in its administration; indeed, there are particular circumstances in scrofula, with reference to the tender texture of the lungs, that directly interdict its use.

It may here, however, be observed, that in pulmonic affections, where vapour from sea-water and sea-air do not prove advantageous, vapour from simple water, or medicated vapour, often answers the desired purpose.

In scrofula affecting the hip-joint; where the first symptoms of that formidable disease have shewn themselves, and where the inci-

pient inflammation is not subdued, the Vapour-bath should be withheld ; but where, after the necessary remedies have proved effectual in preventing the inflammatory action from running into suppuration, and have produced a quiescent state for a time, the Vapour-bath can be relied upon as a means of the greatest utility in completing the cure.

In glandular swellings, whether in a state of ulceration or not, the good effects succeeding to the general and topical application of the Vapour-bath, are often very remarkable, after the failure of a regular course of cold and warm bathing ; this happens but too frequently in those obstinate strumous tumifications of the knee and other larger joints, called WHITE SWELLINGS ; in such cases, however, the state of the bowels, and digestion, will generally be found irregular, a matter of great consequence to be attended to while any hopes of relief are entertained from the usual means, in conjunction with the bath.

In debility, as a consequence of luxation, and in other injuries affecting the tendons

and ligaments of the joints, from gun-shot wounds, contusions, dislocations, &c. the Vapour-bath is a remedy, on which great dependence can be placed, and which, in a number of instances, has succeeded, where other modes of treatment have failed. The waters of Bareges owe their celebrity, in similar cases, to their proper administration, and there are not facts wanting, in this country, where factitious baths of these waters have proved most salutary; it is, however, to be remarked, that in all cases of this character, vapour should be used generally, as well as topically, to command the full effects to be hoped for, and, in most instances, should be persevered in, for a long while, as in all injuries affecting the tendons or ligaments, this remedy is slow in its effects, and general constitutional influence is necessary, conjointly with local means.

Either the warm Douche, or Douche de Vapour, under certain regulations in those cases, is a remedy of the first importance; but the injunctions for its appropriate ap-

plication, as expressed by Monsieur Le Brun, who wrote upon the efficacy of the waters of Bareges, should be attended to: "Son usage est aussi salutaire qu' ancien; on ne laisse pas neanmoins de la prendre souvant mal a-propos, quoiqu'on doive essentiellement se précautionner sur les différens degnés de chaleur et les proportionner à la disposition de la partie infirme, qu'on prenne donc garde de la recevoir sans s'assurer du trop, ou du trop peu de chaleur qu'elle peut avoir. Ce ne pas ici une remarque inutile, puisqu'il arrive souvent que si la douche est trop chaude du commencement qu'on en use, elle rend les maux si rebelles qu'ils ne cedent à aucun remède dans la suite."

CUTANEOUS DISEASES.

Diseases of this description are very numerous, and their varieties considerable; many have their origin in constitutional complaints, while some few are strictly confined primarily to the skin, imparting, in a secondary manner, unhealthy action to

the general habit;—the common itch may serve as an example. Of these many, where the cold bath has no good effect, and where the hot bath is not of sufficient power, the Vapour-bath will be found to succeed.

The sulphurated Vapour-bath frequently proves efficacious in obstinate diseases of the skin, while others, which have resisted different modes of treatment, have given way to the influence of mercurial fumigation judiciously administered; indeed, vapour, from either of the two last-mentioned substances, requires experience and judgment in its selection and application, but, as particular instruction cannot be given in so limited a space, it may be generally understood and confided in, that medicated vapour, impregnated with one substance or another, and appropriately used, will prove of most essential utility in the various species of cutaneous complaints.

During the period that Colonel M'K——y successfully used the Vapour-bath for a long-continued rheumatic complaint, his friend,

General L——s, who accompanied him to Brighton, as much for experiment as amusement, subjected himself to a few Vapour-baths, and was conscious that his health was much improved; but, without expecting any such result, found that an ulcerated leg, which he had from the time of the American war, became better and better daily, and was at length perfectly healed, solely from this means.

Where the stomach, the intestines, the liver, the spleen, the pancreas, &c. are partially or generally in a morbid condition, accompanied with cuticular eruptions, due attention should be paid to these circumstances, (with a view towards their amendment,) either previously to, or in conjunction with the use of vapour fumigation under any form whatever, otherwise little hope can be entertained of a complete removal of the disease on the surface, which will be found, in nine cases out of ten, symptomatic of some visceral complaint. In many of these cases, where a warm sea-water fluid bath

is found to irritate the eruption, no such consequence follows the Vapour-bath of sea or simple water.

Impure diseases, of long continuance, connected with the consequences of an irregular or improper use of mercurial preparations, are but too often found both obstinate and perplexing, and in some, where the periosteum is affected with inflammation and pain, it proves most efficient.

There are few circumstances of disease requiring more serious consideration, and more discrimination in withholding, or in administering the usual remedies; but, among these, medicated vapour, under one form or another, seldom fails of affording relief, and acts in aid of other means, when exhibited at the same time; indeed, many practitioners consider vapour, (when of a suitable kind), as *specific* in a number of cutaneous diseases, strictly so denominated, more particularly in what is commonly called the *ring-worm;* but its application should be reiterated until no vestige remains.

CHAPTER X.

Suspended Animation—Insanity—Mercurial Disease—Fever —Intermittent and Scarlet Fever.

SUSPENDED ANIMATION.

In cases of suspended animation, from drowning or other causes, it most generally happens that instantaneous means are not at hand to apply heat in the necessary degree.

Vapour, from a very small quantity of boiling-water, conveyed from the spout of a tea-kettle, under a thick blanket, previously heated, the body being placed on a table near to the fire on which the kettle rests, may, by a little dexterity, be made to diffuse a very considerable degree of heat in a short time; fomentations from flannels, wrung from hot water, applied to the abdomen and stomach, around the thorax, and particularly over the region of the heart, will at

the same time prove of great use, or the application of heat in the manner directed in page 75, the effect from which is more permanent; in this manner the local and general influence of vapour, of a high temperature, are consentaneously brought into action.

In such cases, vapour from a spirit lamp, as described in page 77, aided by friction and the usual efforts, as directed by the Humane Society, must be had recourse to.

INSANITY.

The causes producing insanity are very numerous, and its degrees and species are manifold, which will, in a measure, account for the various means of relief that are said to be effectual; and hence the cold, tepid, warm, and Vapour-bath have, in their turn, been put to the test.

Generally speaking, the warm and Vapour-bath have succeeded as the best auxiliaries to remedies used in those cases; but the vapour having greater power, in some in-

stances, will prove effectual where the others fail.

Insane patients exposed to vapour should have their hands secured in proper gloves, or by the usual strait-waistcoat, and then placed in a chair, but their feet not allowed to be near the floor; this plan effectually prevents all violent motion.

Sudden alternations, with respect to the cold and warm bath, are effectually obtained, and in a more prompt manner by a quick and immediate use of the shower-bath, before or after exposure to heated vapour, than by immersion ; and, in cases of insanity, and other formidable diseases, to which this practice may be deemed applicable, it should be preferred, more particularly as commencing so active a mode of cure ; it must, however, be confessed that, in these cases, every species of bath has been but too often found ineffectual.

The shower being placed immediately over the patient while exposed to the vapour,

may be applied instantly, and with sudden effect, which often proves salutary in complaints classed under the head of nervous affections.

In a recent case, where a delicate lady used the Vapour-bath, as a means for the removal of a chronic head-ache, by pulling the crank of the shower-bath immediately above her head, in mistake for the bell-pull, the shock and surprise was so great as to cause a beneficial effect; and, by it, her complaint was very nearly removed.

MERCURIAL DISEASE.

It is one of the most happy results of our present experience, that the occurrence of this dreadful evil becomes less and less every day, and that a better knowledge of the administration of mercurial preparations at this moment pervades every department of medical practice, than had existed for years previously.

The consequences of errors on this subject

arose from a most unaccountable and general opinion, that the administration of mercury was the department solely of the surgeon, and hence its use was freely exercised by many juniors in the profession, to the exclusion of the more aged and experienced; this error has had, in its train, misery that we may presume will never again be witnessed.

In the mercurial disease, so called, and in inordinate ptyalism, accompanied with other distressing consequences, arising from the rash and ungarded administration of mercury, its consequences are rendered less irritating, and the deleterious effects producing it very much mitigated, by a judicious use of the Vapour-bath; particularly in conjunction with the other means used under such-like circumstances, its action seems principally upon the absorbent system, and by promoting secretion, to diminish the diseased action, so that, whether the patient is tortured with those most painful ulcera-

tions, which are peculiar to the disease,—nodes, exostosis, and night-pains, along the course of the cylindrical bones, vapour, under the form of bath, and persevered in for a necessary time, is often attended with salutary results; these, however, do not usually follow its immediate use, and a cautious vigilance as to its effects, in the first instance, with due perseverance after, are required to secure success.

FEVER

To equalise the irregular distribution of blood, which in fever occasions such painful and dangerous symptoms, either from its unusual determination to the head, liver, or to any of those organs of life, on the well-being of which so much depends, is an object in the management of diseases of this description, of considerable moment. The irregular application of the Vapour-bath among savage nations, and under an improved form in our modern practice, proves

how numerous and how advantageous are the results from its salutary action on the skin, and its soothing effects upon the nervous system.

Its combined or alternate application in intermittents, in scarlet and typhus fever, under their various stages, will be found an auxiliary of no small utility in the hands of a judicious practitioner—judicious, I say, for the appropriate application of heated vapour, warm bath, or cold effusion, requires discrimination and judgment, in respect to their selection, as suited to the symptoms under which they may be indicated.

Where this happens, in respect to the Vapour-bath, its powers over febrile action, by promoting the free discharge of perspirable matter from the surface, are of the greatest consequence, even in fevers of the worst character, and particularly in those incident to warm climates, where its effects calm and assuage the most urgent symptoms; this effect also follows from its use in cases

of typhus, and under the worse condition of scarlet fever, where the surface of the body and the mucous membrane of the trachia are, at one and the same moment, under its salutary influence.

Under the symptoms of hectic fever, there is but little promise of relief from either the warm or Vapour-bath, in as far as practical experience warrants the observation; and, notwithstanding the once sanguine expectation of Dr. Beddoes upon this subject, but little hope should be placed upon the effects from either, where this symptomatic disease is confirmed in its dreadful character.

CHAPTER XI.

CONCLUSION.

After enumerating the variety of natural sources from which vapour is obtained, and the local modes of applying it, together with those effects which have caused this remedy to become gradually more and more general, from times far remote up to the present period; the artificial means of its application in disease, in this and in different countries, have been particularized and shewn to be productive of nearly equal benefit as in cases submitted to vapour naturally produced, in situations where their repute has been deservedly great and extensive.

In this enumeration, the usual practical application of vapour in Russia, Sweden,

Finland, Spain, France, Italy, Turkey, Persia, Egypt, South America, India, &c. &c. has been severally observed upon, and, from this species of historical detail, a deduction has been fairly drawn, of its very general and practical utility, not only as a means of relief in disease, but as a practice replete with advantage in respect to the health, luxury, and comfort of most nations where it is used, from the most savage people to those of more refined and cultivated character; and as, in many essential particulars, it differs from the warm-bath, where the distinction is considerable, it has been pointed out, in order that its application as a curative means in disease may be made upon fixed principles, and not as hitherto used upon the uncertain and often erroneous grounds of hearsay evidence, as to practical facts and successful cases, without sufficiently pointing out where its use has been followed by injurious consequences or disappointment.

But, had the subject been more divided in detail, and under each specific head, circumstances more minutely considered, the extent of a work intended, in a degree, to be of a condensed and circumscribed character, would have increased out of proportion, and become of less interest and more tedious; hence, also, the insertion of many cases, as illustrative of the good effects of the Vapour-bath, has been carefully withheld, from knowing that more than enough have already been placed before the public; and, with the intention of preventing empiricism, and to avoid confusion and dangerous misconception.

After the view taken of Baths in general, in the countries already mentioned, it has been deemed appropriate to the subject to consider the relative nature of the warm and Vapour-bath, as artificially prepared, so as to imitate what are naturally produced. The density of the former, in respect to the latter, has been shewn to be considerable,

and this circumstance alone, pointed out as serving, in many cases, to account for consequences arising from the one or from the other, in their effects upon the functions of human life, and on those functions when inefficiently performed, or under a state of disease.

As immediately connected with this part of the subject, the pressure of the atmosphere upon the surface of our bodies, together with its weight and elasticity, have been taken into the account, in order that the variations, occasioned by the changes that occur, from time to time, under different degrees of that pressure, may be the more satisfactorily accounted for.

From the aggregate of these facts, and the comparative tenuity of heated air and vapour in a high degree of expansion, sufficient evidence is given to shew why immersing the human body in either, subjects it to the influence of heat through the agency of a rarified medium, which

extends itself not only over the surface, but also at the same instant to the internal surface of the lungs, and imparts it with freedom and celerity.

This last fact accounts for the powers of a Vapour-bath being greater, in almost every instance, than that of the fluid-bath, and is given as a reason for greater prudence and caution being necessary in its use, as a remedy for disease; it may also serve as a reason why the fluid-bath should precede the use of the other as preparatory to its more safe and efficacious administration; the quantum of heat necessary to form vapour being most considerable in comparison of what may be required to heat water for the purpose of an ordinary fluid-bath.

The application of vapour, as a bath, to the condition of disease, is next considered; and that grand sympathetic connection that exists in animal life, between the healthy state of the skin, and that of the viscera and internal organs of life, passed under review.

This leads to favourable results in respect to this remedy, as administered under one form or another, and indicates the advantages to be hoped for, and the inconvenience to be guarded against, by the general and topical evacuation of blood, and the administration of purgatives, so as to render the state of the stomach and alimentary canal suitable to the mode of applying this remedy, under whatever indication it may be directed.

As few diseases affect the human frame without the important functions of the skin becoming more or less concerned, it may be argued that this single fact should, in a degree, serve to account for its general applicability, as remedial in most diseases, but more particularly in those taken notice of in the foregoing part of this Treatise, such as gout, rheumatism, paralysis, hydropic diseases, scrofula, painters' cholic, diseases of the kidney and bladder, glandular swellings, injuries from luxations, cutaneous diseases,

suspended animation from drowning, or other causes, insanity, mercurial disease, typhus, scarlet and intermittent fever, &c.

A proper knowledge of its use, under any variety of these complaints, will lead to its more diversified application, in cases not particularly specified; but, as no active remedy can be said to be at all times exempt from disagreeable consequences, so it is with the Vapour-bath; but, in order to secure from it a successful issue, a general rule should hold good, that the state of the head, the chest, and the bowels, should be well ascertained; and, as far as possible, all objectionable circumstances removed.

The following views of the nature of steam, agreeably to the philosophical and ingenious system of Sir Richard Phillips, to whom I am indebted for this short abstract, may illustrate the *modus operandi* of the action of vapour, a subject hitherto involved in great obscurity.

"Aqueous steam is atoms of water, or of

the bases of water in a state of mechanical separation, caused by motions that have been imparted to them, which motions bear the general name of heat; for heat arises from atoms in intense motion parting with their motion.

"This atomic excitement called heat, is applied to the water, and the atoms being already separated by those gaseous interstices which constitute fluidity, they become ready patients of the excitements, and evolve or radiate into the adjoining space.

"But, as that space is already full of atoms, in the form of aerial gas, these atoms of air deflect the newly-evolved atoms of the water, till continued deflections turn and maintain them in circular orbits; while these again deflect others as they arise, till the space is filled with them in their revolving orbits.

"Of course, as each endeavours to go off in a tangent, the orbits, or the space or spaces which the atoms thus fill, is, as the original excitement; for the orbits are created by a

definite reaction of atoms of air, and they therefore vary as the original action or heat, of which the atoms are the patients.

" The energy of the steam depends, however, on its confinement; for the energy is merely reaction, and, if there is no solid boundary, or the aerial gas yields, then the reaction or compression is diminished, and not greater than that of the aerial gas itself.

" At the same time, as the atoms of the air press with an energy of fifteen pounds to the square inch, and this action precedes the reaction, there may be a slight increase of pressure, but not sufficient to cause a permeation of solid bodies placed within the steam.

" If compression or confinement is complete, then the pressure, being as the excitement, may be raised by continuity of action and constant *acceleration* of momenta to very high degrees of force, as we witness in gaseous explosions, which arise from the atoms being one and all excited into orbits larger than the space will contain.

"But, before an explosion takes place, every permeable body, within the confined aqueous gas, will become saturated with its atoms and its action, and thus timbers are rendered pliable, meat boiled, &c.

"The effect on the human body seems to consist in the increased action of the atoms on the surface of the skin, and in a slight degree of permeation; while, as the aqueous atoms occupy the space, without filling it, with their substances, there are interstices, or vacuums, between them, which permit an increased radiation or perspiration from the pores of the skin. Hence, as the excitement proceeds, the temperature diminishes, till at length the vacuities of highly-excited gas create even a sense of extreme coldness, by the rapid perspiration which they admit. We, therefore, are enabled, by means of aqueous gas, to apply to the skin a high degree of excitement, without the inconvenience of a corresponding degree of diffused heat.

"Of course, any body or substance, which

takes off or receives the momenta of the orbit-describing atoms, refixes them and they return to water.

"Gas, of every kind, is formed and exists in like manner, and hence there is momentum or power wherever there is gas; and the refixing of certain portions of aerial gas by inspiration imparts the momenta of the atoms to the animal, and hence animal heat, strength, energy, and life; hence, also, combustion, and an infinite number and variety of other important phenomena.

"Water is so readily converted into steam, by the want of cohesion or division of its atoms, that the resulting gas is simple; and the atoms are unmixed and uncombined, like those of gases created from bodies which require greater and longer excitement. Hence it may, in common parlance, be said to be coarser gas, and thus its interstices, and peculiar effects on the skin. But, if other bodies or fluids are mingled with it, and they are raised into gas together, the

results may be varied, and either improved or deteriorated, as may appear by experiment. Thus the interstices may be filled up, and the perspiration be less, or a chemical character may be conferred, in harmony or discordance with the natural chemical action of the body placed within the heterogeneous gaseous compound.

"Improved views of electrical and galvanic excitement accord with the known effects of chemical agents applied to the skin. Those views suggest, that, as oxygen is fixed at the lungs of animals, a correlative action of nitrogen is demanded at the surface of the skin; and hence an animal is a galvanic combination subject to a constant galvanic action. We thus comprehend the reason why inflammable substances applied to the skin increase the action, and cure its injuries and diseases. We thus understand, also, the mode by which nitrogen incorporates with animal substance, and discover, in the same two-fold action, the cause of the changes in

the colour of the blood. Steam appears, therefore, to be a convenient vehicle for bringing chemical agents into contact with the skin, and for varying the natural galvanic action of the system."

FINIS.

DESCRIPTION OF THE VAPOUR BATH, AS USED AT BRIGHTON.

(See Frontispiece.)

A hollow space on the floor of the bathing apartment, the sides and bottom being of solid plank, is interposed, for the immediate reception of the vapour.

This is of an oval form, having its upper surface of strong wicker-work;—on this the patient is seated upon a chair or stool, with wicker-work bottom.

The frame consists of six wooden pillars, resting on the circumference of the plane of the wicker-work, and, upon the upper edge of the sides of the enclosed space:—

The pillars support a canopy of six curved ribs, meeting at a small circle at top, which serves as a space for a valve to permit the exit of vapour, when its temperature may require to be lowered, or the respirable quality of the air to be renewed.

The frame is covered over with a thick white woollen cloth, so manufactured as to be as impervious to steam as possible, which completely retains the vapour.

On the side of this thick covering, are openings for the purpose of allowing the patient to respire freely the air of the apartment, or to admit of the attendants introducing the hand or flesh brush, should friction be required while the patient is under the influence of the vapour.

A tube for conveying the vapour from the boiler, enters the hollow space on which the frame-work rests, and is provided with a stop-cock, by which the admission or exclusion of the vapour is under controul.

The boiler with a safety-valve should be of good strength, and placed in a separate apartment beneath that in which the bath is used, where also the convenience of a shower and warm fluid bath should be at hand, in order that the alternation of the one or the other may be used at pleasure.

Plate I. Fig. I. the hollow space A A A A. Fig. II. B B B B, the wicker-work, on the frame of which, at a a a a, the pillars C C C C, Fig. I. rest.

The curved ribs D D D D of the canopy meet at the circle E, the space for the valve—F the stop-cock—G the stool on which the patient sits, as marked on the plane of the wicker-work in Fig. II.

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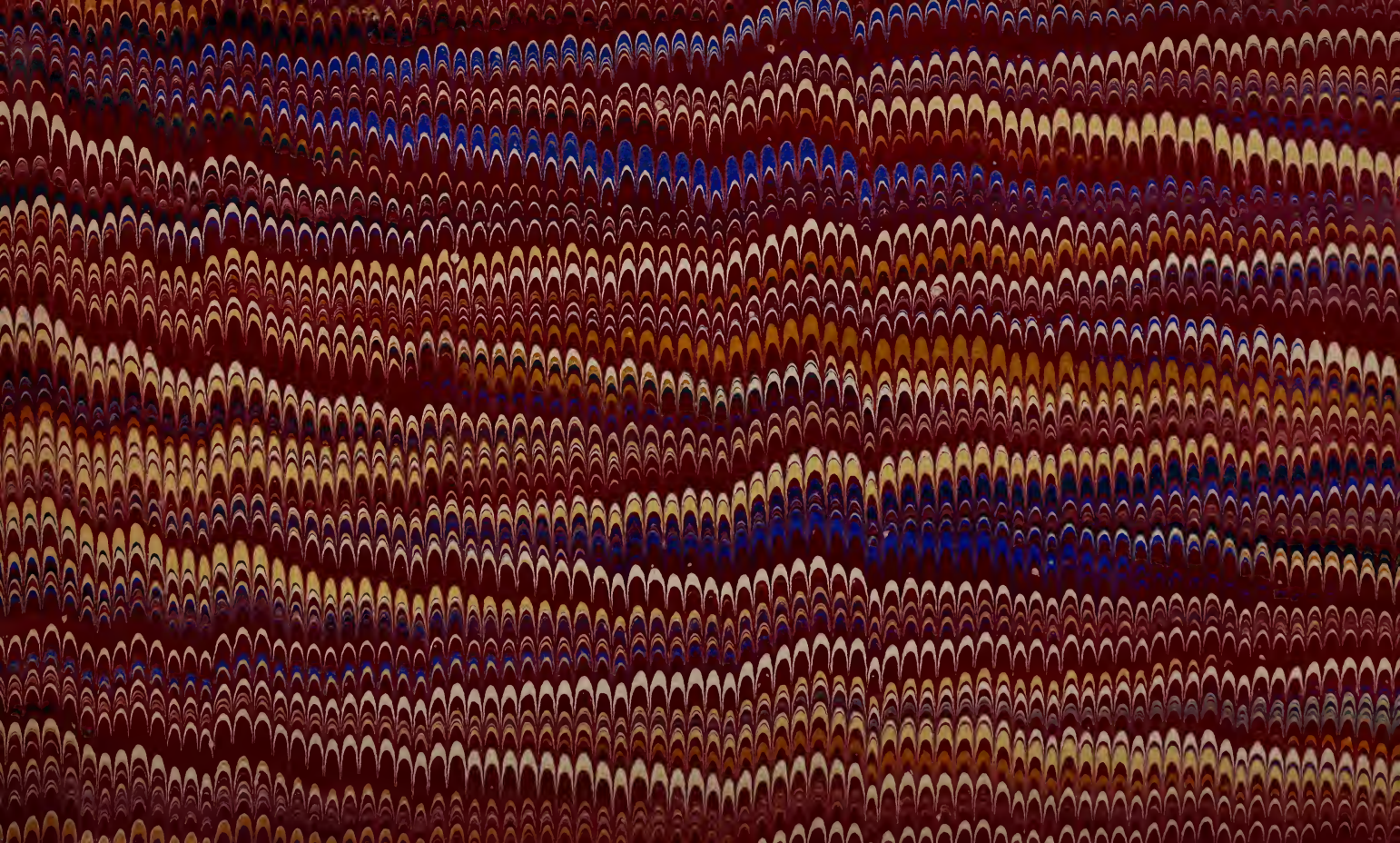

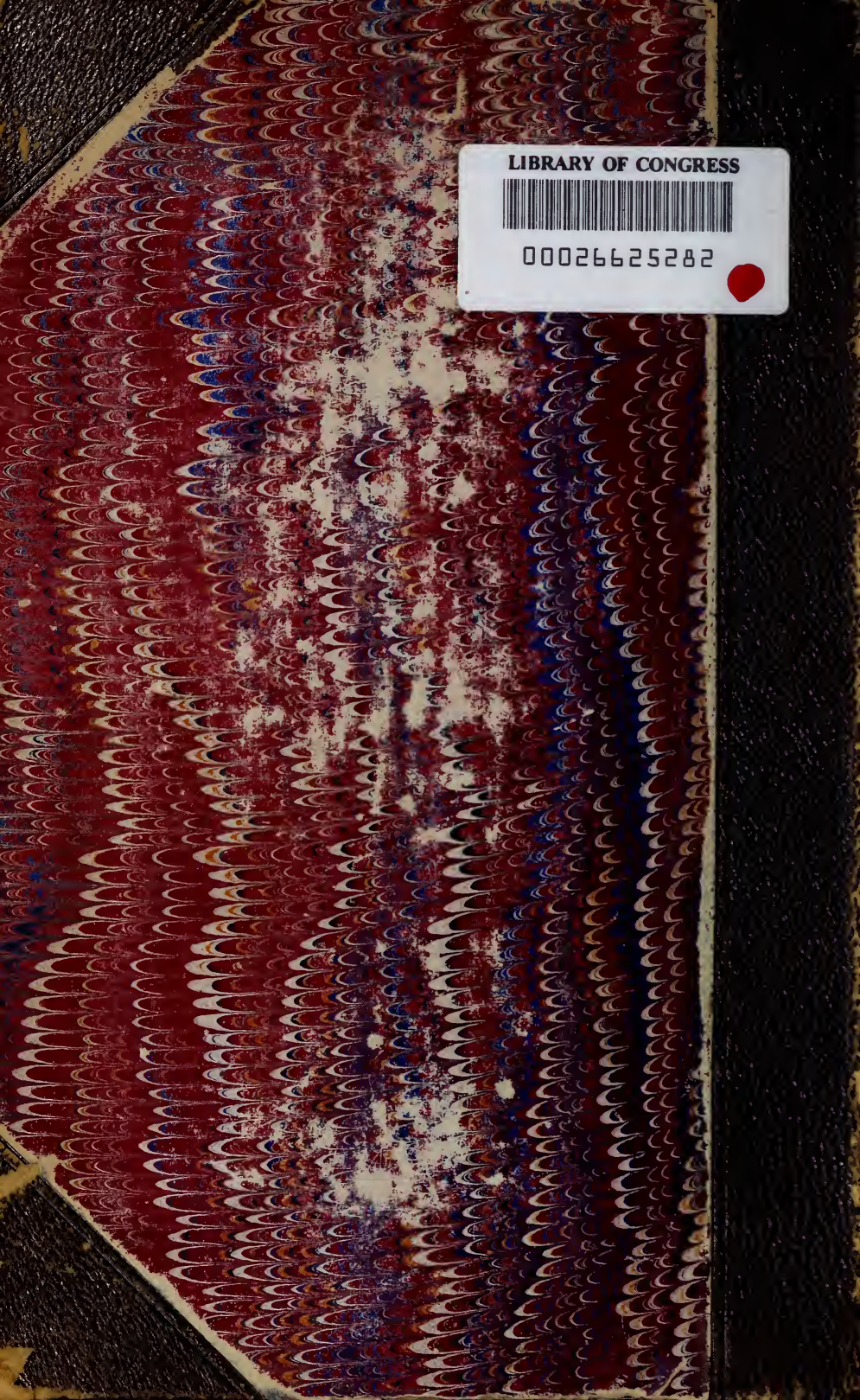
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